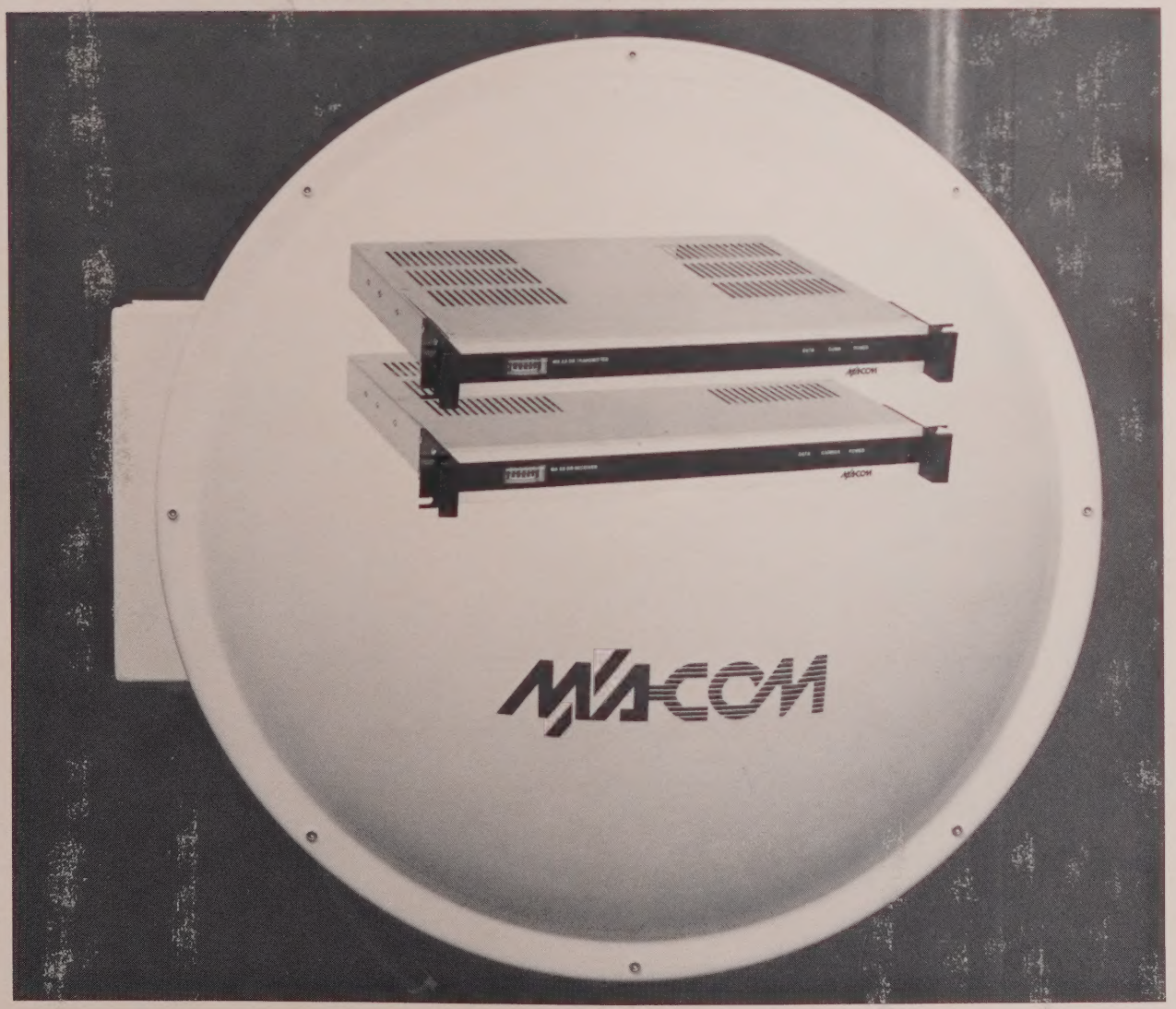
IM 808822B

MAC-23 PRODUCT LINE

MA-23DR

TRANSMITTER/RECEIVER



MAINTENANCE MANUAL

MP MASTER
MA29167

PROPRIETARY NOTICE

The information and design disclosed herein was originated by and is the property of M/A-COM, Inc. M/A-COM reserves all patent proprietary design, manufacturing, reproduction use, and sales rights thereto, and to any article disclosed therein, except to the extent rights are expressly granted to others. The foregoing does not apply to vendor proprietary parts.

Specifications are subject to change in order to allow the introduction of design improvements.

Copyright 1986, M/A-COM MAC, Inc.
5 Omni Way
Chelmsford, MA 01824
(617) 272-3100 X7700
Printed in U.S.A.

TABLE OF CONTENTS

SECTION 1 – EQUIPMENT DESCRIPTION

Scope 1-1
General 1-1
Duplex System (Unprotected) 1-1
Hot Standby Duplex System 1-1

SECTION 2 – THEORY OF OPERATION

Duplex System (Unprotected) 2-1
Transmitter Digital Interface Unit 2-1
Transmitter Power Supply 2-1
Receiver Digital Interface Unit 2-3
Receiver Baseband Board 2-3
Receiver Power Supply 2-3
Duplex RF Assembly 2-4
RF Branching 2-4
TX RF Section (P/O Duplex RF Assembly) 2-4
RX RF Section (P/O Duplex RF Assembly) 2-4
RFI Board 2-4
Hot Standby Duplex System 2-4
Transmitter and Receiver Digital Interface Units 2-4
Automatic Hot Standby Switchover Unit 2-4
Hot Standby Duplex RF Assembly 2-8

SECTION 3 – SYSTEM ALIGNMENT AND CHECKOUT

General 3-1
Maintenance Log 3-2
Internal Controls, Indicators, and Test Points 3-2
Alignment Procedures 3-3
Power Checkout 3-3
Transmitter Digital Interface Unit Power Checkout 3-3
Receiver Digital Interface Unit Power Checkout 3-3
Transmitter Digital Interface Unit Alignment 3-3
Transmitter RF Box Alignment 3-5
Receiver RF Box Alignment 3-6
Transmitter RF Box Deviation Adjustment 3-6
Receiver RF Box IF Output Level 3-11
Receiver Digital Interface Unit Alignment 3-11
180 MHz VCO Alignment 3-11
40 MHz IF AGC Check 3-11
Bit Synch VCO Alignment 3-12
VCO Phase Adjustment 3-12
Alarm Relay Check 3-12
Received Carrier Level Check 3-12
Eb/No Measurement 3-15
Scrambler/Descrambler Reinstallation 3-15

SECTION 4 – MAINTENANCE & TROUBLESHOOTING

General 4-1
Maintenance Log 4-1
Preventive Maintenance 4-1
Periodic Maintenance 4-1
Semi-Annual Checks 4-1
Annual Checks 4-1
Corrective Maintenance 4-2
Troubleshooting Procedures 4-2
Hot Standby Troubleshootin 4-2
Recommended Spares 4-2
Standby MA-23DR Spare Part 4-8
MA-23DR Subsystem (Unprotected) 4-8
MA-23DR Subsystem (Protected Hot Standby) 4-8
MA-23DR Circuit Board/Component Spares Kit (Unprotected) 4-8
MA-23DR Circuit Board/Component Spares Kit (Protected Hot Standby) 4-8
Notes to Spare Parts List (MA-23DR & MA-23DR12T) 4-8

SECTION 5 – DIAGRAMS

List of Diagrams 5-1

SECTION 6 – PARTS LISTS

List of Parts Lists 6-1

LIST OF ILLUSTRATIONS

Figure 1-1. Duplex System (Unprotected) – Simplified Block Diagram 1-2
Figure 1-2. Hot Standby Duplex System – Simplified Block Diagram 1-3

Figure 2-1. Transmitter Baseband Board – Functional Block Diagram 2-2
Figure 2-2. Transmitter Power Supply – Functional Block Diagram 2-2
Figure 2-3. Carrier Recovery Section of Receiver Baseband Board 2-5
Figure 2-4. Clock Recovery Section of Receiver Baseband Board 2-5
Figure 2-6. Duplex RF Assembly (Unprotected) – Functional Block Diagram 2-7
Figure 2-7. Hot Standby Duplex System – Functional Block Diagram 2-9

Figure 3-1. Transmitter Digital Test Configuration 3-4
Figure 3-2. Input Data Waveform 3-5
Figure 3-3. Eye Pattern Waveform 3-5
Figure 3-4. Transmitter RF Box Test Configuration 3-7
Figure 3-5. Receiver RF Box Test Configuration 3-9
Figure 3-6. Receiver Digital Test Configuration 3-13
Figure 3-7. Receiver Eye Pattern 3-15
Figure 3-8. VCO Phase 3-15
Figure 3-9. Eb/No Amplifier 3-16

Figure 4-1. Trouble Analysis Flow Diagram (Chart A) ... 4-4
Figure 4-2. Trouble Analysis Flow Diagram (Chart B) ... 4-5
Figure 4-3. Trouble Analysis Flow Diagram (Chart C) .. 4-6
Figure 4-4. Trouble Analysis Flow Diagram (Chart D) .. 4-7
Figure 4-5. Trouble Analysis Flow Diagram (Chart E) ... 4-8

Figure 5-1. MA-23DR Transmitter Assembly PN 1841558F 5-3
Figure 5-2. Transmitter Baseband Board – Component Locations PN 1841556S 5-5
Figure 5-3. Transmitter Baseband Board – Schematic Diagram PN 1841556S (Sheet 1 of 2) 5-7
Figure 5-3. Transmitter Baseband Board – Schematic Diagram PN 1841556S (Sheet 2 of 2) 5-9
Figure 5-4. Line Equalizer – Component Locations/ Schematic Diagram PN 1841568A 5-11
Figure 5-5. Cable Simulator – Component Locations/ Schematic Diagram PN 842711A 5-12
Figure 5-6. Cable Simulator – Component Locations/ Schematic Diagram PN 841973A 5-13
Figure 5-7. Meter Assembly PN 1841749A 5-14
Figure 5-8. Power Supply – Component Locations PN 1841570D 5-15
Figure 5-9. Power Supply – Schematic Diagram PN 1841570D 5-17
Figure 5-10. Power Supply – Component Locations PN 1841554C 5-19
Figure 5-11. DC/DC Converter – Component Locations PN 843490B 5-21
Figure 5-12. DC/DC Converter – Schematic Diagram PN 843490B 5-23
Figure 5-13. DC/DC Converter – Component Locations PN 843512-1B 5-25
Figure 5-14. DC/DC Converter – Schematic Diagram PN 843512-1B 5-27
Figure 5-15. MA-23CC Receiver Assembly PN 1841560G 5-29
Figure 5-16. Receiver Baseband Board – Component Locations PN 1841562S 5-32
Figure 5-17. Receiver Baseband Board – Schematic Diagram PN 1841562S (Sheet 1 of 2) 5-33
Figure 5-17. Receiver Baseband Board – Schematic Diagram PN 1841562S (Sheet 2 of 2) 5-35
Figure 5-18. 40 MHz IF Filter Board – Component Locations/Schematic Diagram PN 1841578E 5-37
Figure 5-19. MA-23DR RF Box Assembly PN 1841478H 5-39
Figure 5-20. Regulator Board – Component Locations/ Schematic Diagram PN 1841788K 5-41
Figure 5-21. RFI Filter – Component Locations/ Schematic Diagram PN 1841720E 5-43
Figure 5-22. Receiver Mixer/Oscillator/Preamplifier Assembly PN 1842870C 5-45
Figure 5-23. 140 MHz IF Amplifier – Component Locations PN 1843901-1A 5-48
Figure 5-24. 140 MHz IF Amplifier – Schematic Diagram PN 1843901-1A 5-49
Figure 5-25. 140 MHz Preamplifier – Component Locations/Schematic Diagram PN 1841936-1G 5-51
Figure 5-26. 24 GHz Mixer/Oscillator Assembly PN 842871C 5-53
Figure 5-27. Temperature Control Board – Component Locations/Schematic Diagram PN 842744-1B 5-54
Figure 5-28. Hot Standby Switch Assembly PN 842340C (Sheet 1 of 2) 5-55
Figure 5-28. Hot Standby Swtich Assembly PN 842340C (Sheet 2 of 2) 5-57
Figure 5-29. Display Board – Component Locations PN 843330-1B 5-60
Figure 5-30. Display Board – Schematic Diagram PN 843330-1B 5-61
Figure 5-31. Control Logic – Component Locations PN 843334-1A 5-63
Figure 5-32. Control Logic – Schematic Diagram PN 843334-1A 5-65
Figure 5-33. Backplane – Component Locations PN 843332-1A 5-68
Figure 5-34. Backplane – Schematic Diagram PN 843332-1A 5-69
Figure 5-35. AC Power Supply – Component Locations PN 842640-1C 5-72
Figure 5-36. AC Power Supply – Schematic Diagram PN 842640-1C 5-73
Figure 5-37. AC Power Supply – Component Locations PN 842642-1A 5-75
Figure 5-38. Hot Standby Duplex RF Assembly PN 842900A 5-76
Figure 5-39. Transmitter Hot Standby RF Assembly PN 842901-1 5-77
Figure 5-40. Transmitter Source PN 1840242J 5-79
Figure 5-41. Input RFI Filter – Schematic Diagram PN 843411-1 5-80
Figure 5-42. RFI Board – Component Locations Schematic Diagram PN 843806 5-81
Figure 5-43. Receiver Hot Standby RF Assembly PN 842902-1 5-83
Figure 5-44. 140 MHz IF Amplifier – Component Locations Schematic Diagram PN 1841930-1E 5-85

LIST OF ILLUSTRATIONS (CONT)

Figure 5-45. Negative Switch Driver – Component Locations/Schematic Diagram PN 842907A 5-87
Figure 5-46. Power Supply Interconnect Assembly PN 1841574 5-89
Figure 5-47. DC/DC Converter – Wiring Harness PN 843755A 5-89
Figure 5-48. RF Box – Wiring Harness PN 1841847-1B 5-89
Figure 5-49. Mixer/Oscillator – Wiring Harness PN 842869-1B 5-90
Figure 5-50. LED – Wiring Harness PN 843333-1A 5-90
Figure 5-51. DC Power Supply – Wiring Harness PN 843807-1A 5-90
Figure 5-52. TX Power – Wiring Harness PN 843436-1A 5-91
Figure 5-53. TX Data and Alarm – Wiring Harness PN 843442-1A 5-91
Figure 5-54. RX1 and RX2 Interconnect – Wiring Harness PN 843431A 5-92
Figure 5-55. AC Power Supply – Wiring Harness PN 843510-1B 5-92
Figure 5-56. Transmitter Wiring Harness Assembly PN 1841847-1B 5-92
Figure 5-57. Hot Standby RF Head – Wiring Harness PN 842916-1 5-93
Figure 5-58. Waveguide Switch – Wiring Harness PN 842919-1B 5-93
Figure 5-59. IF Amplifier – Wiring Harness PN 1841879-1 5-93
Figure 5-60. Power Wiring Harness Assembly PN 1841722-1 5-94
Figure 5-61. Receiver Wiring Harness Assembly PN 1841850A 5-94
Figure 5-62. Hot Standby RF Head – Wiring Harness PN 843816B 5-94
Figure 5-63. Power Cable – Receiver Simplex PN 1841932B 5-95
Figure 5-64. Power Cable – Transmitter Simplex PN 1842030B 5-95
Figure 5-65. Power Cable Hot Standby PN 843343B 5-96

LIST OF TABLES

Table 3-1. Recommended Test Equipment 3-1
Table 3-2. Transmitter Digital Interface Unit – Internal Controls 3-2
Table 3-3. Transmitter RF Box Assembly – Internal Controls 3-2
Table 3-4. Receiver Digital Interface Unit – Internal Controls 3-2
Table 3-5. Receiver RF Box Assembly – Internal Controls 3-2
Table 3-6. Balanced Input Impedance 3-4
Table 3-7. Test Equipment Setup (RF Signal Generator and Pattern Generator) 3-5
Table 3-8. Alarm Relay Contacts 3-5
Table 3-9. Balanced Output Impedance 3-11
Table 3-10. VCO Tuning 3-12
Table 3-11. Alarm Relay Contacts 3-12
Table 3-12. Receiver Threshold 3-15

Table 4-1. Transmitter – Troubleshooting 4-1
Table 4-2. Receiver – Troubleshooting 4-2
Table 4-3. Hot Standby – Troubleshooting 4-3

PARTS LISTS

1. Transmitter Assembly PN 1841558 6-2
2. Transmitter Baseband Board PWB Assembly PN 1841556-1 6-3
3. Transmitter Baseband Board PWB Assembly PN 1841556-2 6-8
4. Transmitter Baseband Board PWB Assembly PN 1841556-3 6-13
5. Transmitter Baseband Board PWB Assembly PN 1841556-4 6-18
6. Transmitter Baseband Board PWB Assembly PN 1841556-5 6-23
7. Line Equalizer PWB Assembly PN 1841568-1 6-28
8. Line Equalizer PWB Assembly PN 1841568-2 6-29
9. Line Equalizer PWB Assembly PN 1841568-3 6-30
10. Line Equalizer PWB Assembly PN 1841568-4 6-31
11. Line Equalizer PWB Assembly PN 1841568-5 6-32
12. Cable Simulator PWB Assembly PN 1842711 6-33
13. Line Equalizer PWB Assembly PN 1841973 6-34
14. Meter Assembly PN 1841749-1 6-35
15. Transmitter Power Supply Assembly PN 1841570-2 6-36
16. Transmitter Power Supply PWB Assembly PN 1841554-2 6-37
17. DC DC Converter Assembly PN 843490-2 6-39
18. DC DC Converter Assembly PWB Assembly PN 843492-1 6-40
19. Receiver Assembly PN 1841560-1 6-42
20. Receiver Baseband Board PWB Assembly PN 1841562-1 6-43
21. Receiver Baseband Board PWB Assembly PN 1841562-2 6-54
22. Receiver Baseband Board PWB Assembly PN 1841562-3 6-65
23. Receiver Baseband Board PWB Assembly PN 1841562-4 6-76
24. Receiver Baseband Board PWB Assembly PN 1841562-5 6-87
25. 40 MHz IF Filter PWB Assembly PN 1841578-1 .. 6-98
26. 40 MHz IF Filter PWB Assembly PN 1841578-2 .. 6-99
27. 40 MHz IF Filter PWB Assembly PN 1841578-3 . 6-100
28. 40 MHz IF Filter PWB Assembly PN 1841578-4 . 6-101
29. 40 MHz IF Filter PWB Assembly PN 1841578-5 . 6-102
30. Reeiver PowerSupply Assembly PN 1841570-1 6-103
31. Receiver Power Supply PWB Assembly PN 1841554-1 6-104
32. DC DC Converter Assembly PN 843490-1 6-105
33. DC/DC Converter PWB Assembly PN 843512-1 6-106
34. RF Box Assembly (Duplex) PN 1841478-1 6-108
35. RF Box Assembly (TX Simplex) PN 1841478-2 . 6-109
36. RF Box Assembly (RX Simplex) PN 1841478-3 . 6-110
37. Transmitter Voltage Regulator Board PN 1841788-2 6-111
38. Receiver Voltage Regulator Board PN 1841788-1 6-112
39. RFI Board PWB Assembly PN 1841720-1 6-113
41. 140 MHz IF Amplifier PWB Assembly PN 843901-1 6-115
42. 140 MHz Filter/Preamplifier PWB Assembly PN 1841936-1 6-117
43. Temperature Control PWB Assembly PN 1842744-1 6-119
44. Hot Standby Switch Assembly PN 842340-1 6-120
45. Display Board PWB Assembly PN 843330-1 6-121
46. Control Logic Board PWB Assembly PN 843334 6-122
47. Backplane PWB Assembly PN 843332-1 6-123
48. Hot Standby Switch Assembly PN 842340-2 6-125
49. AC Power Supply Assembly PN 842640 6-126
50. AC Power Supply PWB Assembly PN 842642 .. 6-127
51. Hot Standby Duplex RF Assembly PN 842900 .. 6-128
52. Hot Standby RF Box Assembly PN 842901 6-129
53. RFI Board PWB Assembly PN 843411 6-130
54. Hot Standby RF Box Assembly PN 842902 6-131
55. RFI Board PWB Assembly PN 1841720-2 6-132
56. 140 MHzIF Amplifier PWB Assembly PN 1841930-1 6-133
57. Negative Switch Driver PWB Assembly PN 842907 6-135
58. Power Supply Interconnect Wiring Harness Assembly PN 1841574 6-137
59. DC/DC Converter Wiring Harness Assembly PN 843755-2 6-138
60. Mixer/Oscillator Wiring Harness Assembly PN 842869-1 6-139
61. LED Wiring Harness Assembly PN 843333 6-140
62. DC Power Supply Wiring Harenss Assembly PN 843807 6-141
63. TX Power Wiring Harness Assembly PN 843442 6-142
64. TX Data and Alarm Wiring Harness Assembly PN 843442 6-143
65. RX Interconnect Wiring Harness Assembly PN 843431-1 6-144
66. RX Interconnect Wiring Harness Assembly PN 843431-2 6-145
67. Power Supply Interconnect Wiring Harness Assembly PN 843510 6-146
68. Hot Standby RF Head Wiring Harness Assembly PN 842916 6-147
69. Waveguide Switch Wiring Harness Assembly PN 842919 6-148
70. 140 MHz IF Amplifier Wire Harness Assembly PN 1841879-1 6-149
71. Power Wire Harness Assembly PN 1841722-1 6-150
72. Receiver Wire Harness Assembly PN 1841850-1 6-151
73. Hot Standby RF Head Wire Harness Assembly PN 843816 6-152
74. Receiver Simplex Power Cable PN 1841932-1 6-153
75. Transmitter Simplex Power Cable PN 1842030-1 6-154
76. Hot Standby Power Cable Assembly PN 843343 6-155

Digitized by the Internet Archive
in 2025

https://archive.org/details/manualsplus_06873

SECTION 1
INTRODUCTION

SCOPE

This document provides maintenance and troubleshooting information for M/A-COM's MA-23DR Digital Microwave Systems.

The contents of this manual are as follows:

Section 1 – Introduction
Section 2 – Theory of Operation
Section 3 – System Alignment and Checkout
Section 4 – Maintenance and Troubleshooting
Section 5 – Engineering Drawings
Section 6 – Parts Lists

GENERAL

M/A-COM's MA-23DR System is a low cost, solid-state digital microwave system that provides reliable digital communications in the 21.2 to 23.6 GHz frequency band. The MA-23DR is FCC type accepted for operation throughout the Common Carrier (Part 21) and Private Operational Fixed (Part 94) bands. This system is ideal for common carrier or private digital spurs, PBX-to-PBX links, local area network (LAN) traffic, and other telephony and data transmission services.

The MA-23DR system is based on a frequency-modulated, frequency shift keyed (FM-FSK), solid-state radio operating at 23 GHz that is capable of handling T1, T1C, T2 (T-Carrier), CEPT1, or CEPT2 (CCIR) digital data rates. The MA-23DR is compatible with Bell interface standards for channel banks, multiplexers, and other digital interface equipment.

The compact, lightweight MA-23DR system is engineered to provide troublefree performance and simplicity of operation with a full range of system configuration options including multiplexing (up to four duplex systems with a single antenna using optional Stacking/Combiner Kits) or fully redundant hot standby duplex systems. The compact MA-23DR radio is optionally available with 4 foot or 6 foot parabolic antennas (2 foot dishes standard)

DUPLEX SYSTEM (UNPROTECTED)

Each terminal of the basic MA-23DR Digital Duplex system is comprised of a 2 foot high performance parabolic antenna (4 or 6 foot antennas optional), a Duplex RF Assembly, a Transmitter Digital Interface Unit, and a Receiver Digital Interface Unit. A simplified block diagram of the unprotected MA-23DR Duplex System is given in Figure 1-1.

HOT STANDBY DUPLEX SYSTEM

M/A-COM's MA-23DR Automatic Hot Standby Duplex System features solid-state logic circuitry with waveguide switching and sensing to protect against equipment failures and provide uninterrupted service for critical data transmision applications in the 21.2 to 23.6 GHz frequency band.

Each terminal of the MA-23DR Automatic Hot Standby Duplex System is comprised of a 2 foot parabolic antenna (4 or 6 foot antennas optional), a Hot Standby Duplex RF Assembly with mounting hardware, two Transmitter Digital Interface Units, two Receiver Digital Interface Units, an Automatic Hot Standby Switchover Unit, and interconnect cabling. A simplified block diagram of the MA-23DR Hot Standby Duplex System is given in Figure 1-2.

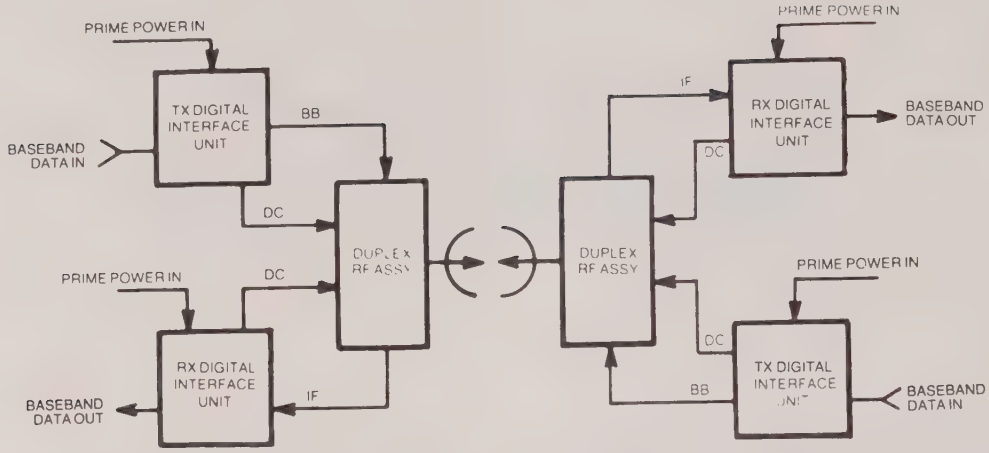


Figure 1-1. Duplex System (Unprotected) – Simplified Block Diagram

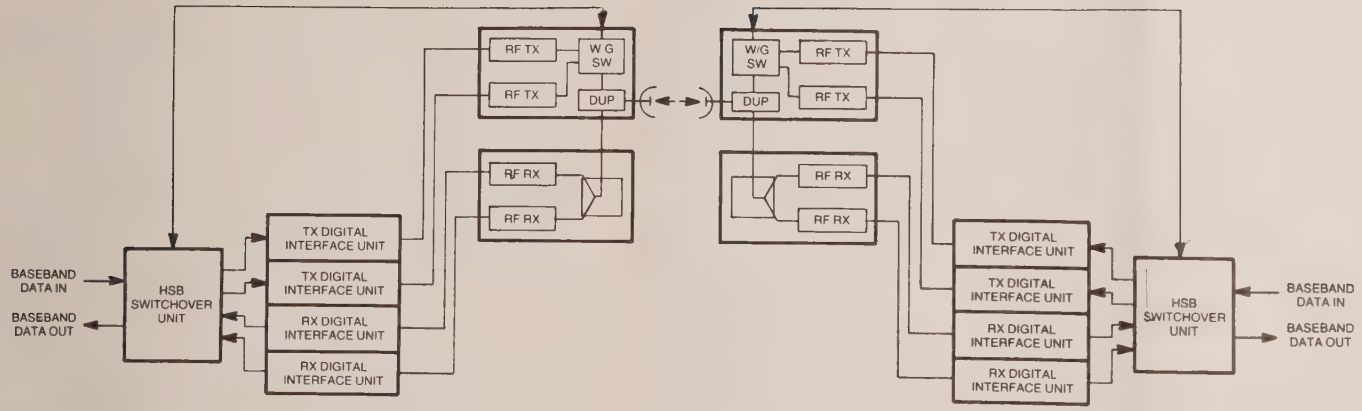


Figure 1-2. Hot Standby Duplex System – Simplified Block Diagram

SECTION 2
THEORY OF OPERATION

DUPLEX SYSTEM (UNPROTECTED)

The incoming baseband data signal is applied to the Transmitter Digital Baseband Unit for processing before it is sent via interconnecting cable to the transmit side of the Duplex RF Assembly. Here, the baseband signal modulates an internally generated 23 GHz carrier that is routed to the antenna for propagation over a line-of-sight (LOS) microwave signal path to the Receiving site.

At the receive site, the incoming 23 GHz RF signal is applied to the receive side of the Duplex RF Assembly where it is downconverted to a 140 MHz intermediate frequency before it is sent via interconnecting cable to the Receiver Digital Interface Unit for processing. Here, the 140 MHz IF signal is downconverted to 40 MHz before the signal is demodulated to recover the transmitted data.

TRANSMITTER DIGITAL INTERFACE UNIT

The Transmitter Digital Interface Unit is comprised of two main subassemblies: the Transmitter Baseband Board and the Transmitter Power Supply Board. The Transmitter Baseband Board is configured at the factory for the specified data rate (T1, T1C, T2, CEPT1, or CEPT2) and interconnection cable length (up to 1,000 feet). All versions of the Transmitter Baseband Board are topologically identical to one another, only component values on the main board and Cable Equalizer (or Cable Simulator) plug-in boards change from group to group. A functional block diagram of the Transmitter Baseband Board is given in Figure 2-1.

The baseband data signal input is either a differential twisted pair (at barrier strip TB3) or a single ended 75 ohm coaxial (at connector J6) depending on the orientation of shorting plugs W1 and W2. After equalization by the Cable Equalizer (or Cable Simulator) plug-in board, the signals are coupled through transformer T1 to a threshold detector circuit formed by Q2, Q2, U5, U7, and U8, followed by level slicing circuitry consisting of U6, Q3, Q15, and Q18. When the signal exceeds a preset threshold, U7 turns off the level slicer.

There is provision on the Transmitter Baseband Board for an optional plug-in Scrambler Board. However, when secure transmission of sensitive data is required, use of M/A-COM's Data Encryption/Decryption Unit is recommended. This external unit is a high speed, full duplex digital data encryption/decryption device that encrypts the baseband signal bit-by-bit (true cypher encryption; not pseudo-random scrambling) in accordance with the Data Encryption Standard (DES) algorithym endorsed by the National Bureau of Standards and specified for use by the Departments and Agencies of the Federal Government under Federal Standard 1027.

After processing by the level slicer, the signal is low pass (Nyquist) filtered by two cascaded Sallen-Key stages. Transistors Q4 Q5 and Q8 Q9 form the unity gain buffers needed in the Sallen-Key topology, while Q6, Q7, and U9 provide bias. The filtered signal is then fed to an output amplifier stage formed by transistors Q10 through Q13, and Q16, before appearing at the DATA OUT connector J4. A sample of the amplifier output signal is fed to a peak detector circuit formed by Q22 through Q25 and U12 and U13. A dc level proportional to the level of the data output signal is sent to the alarm circuitry which controls the state the DATA LED and summary alarm relay K1. A Form C, dry relay contact summary alarm is provided when data is lost, TX source (Gunn) current is too high or too low, or there is a prime power failure. All power for the circuitry on the Transmitter Baseband Board is drawn through regulators U1 through U4 and U9. Power for the transmit side of the Duplex RF Assembly is also present on the board. Gunn current flows through fuse F1 and the front panel meter. Additionally, a dc level indicating the load status of the Gunn supply is sent to the alarm circuitry (mentioned above) which controls the state of the GUNN LED and relay K1.

TRANSMITTER POWER SUPPLY

AC power is connected to the Power Supply via a mains selector card. To change the input supply voltage, the fuse must be removed, then the mains selector card can be removed, oriented for the appropriate voltage and reinserted. Available mains are 100/120, and 220/240 Vac. A functional block diagram of the Transmitter Power Supply is given in Figure 2-2.

The ac power input is fused and applied to the primary winding of transformer T1. Multiple secondary taps on the transformer provide outputs into three bridge rectifiers followed by capacitive input filters. The Power Supply produces three unregulated dc ouptuts (+10, +18, and −20 Vdc) and a fourth, regulated +14 Vdc output for the Transmitter RF circuits. Regulation of the +14 Vdc supply is intentionally soft to reduce dissipation of the pass transistor to a minimum

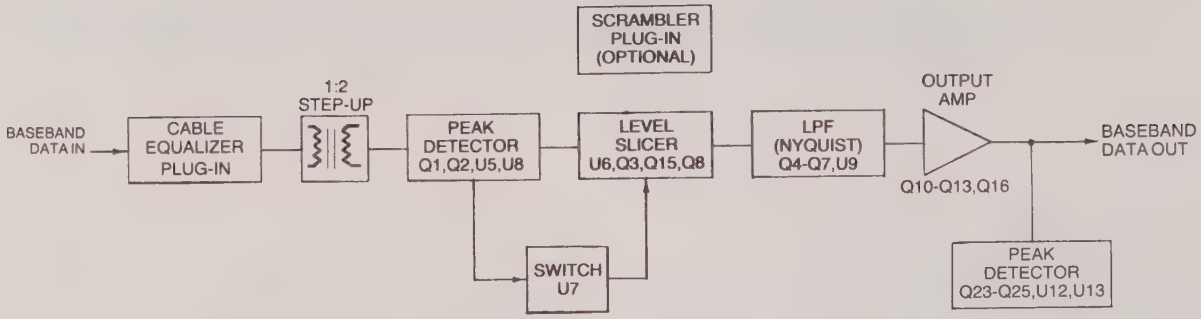


Figure 2-1. Transmitter Baseband Board – Functional Block Diagram

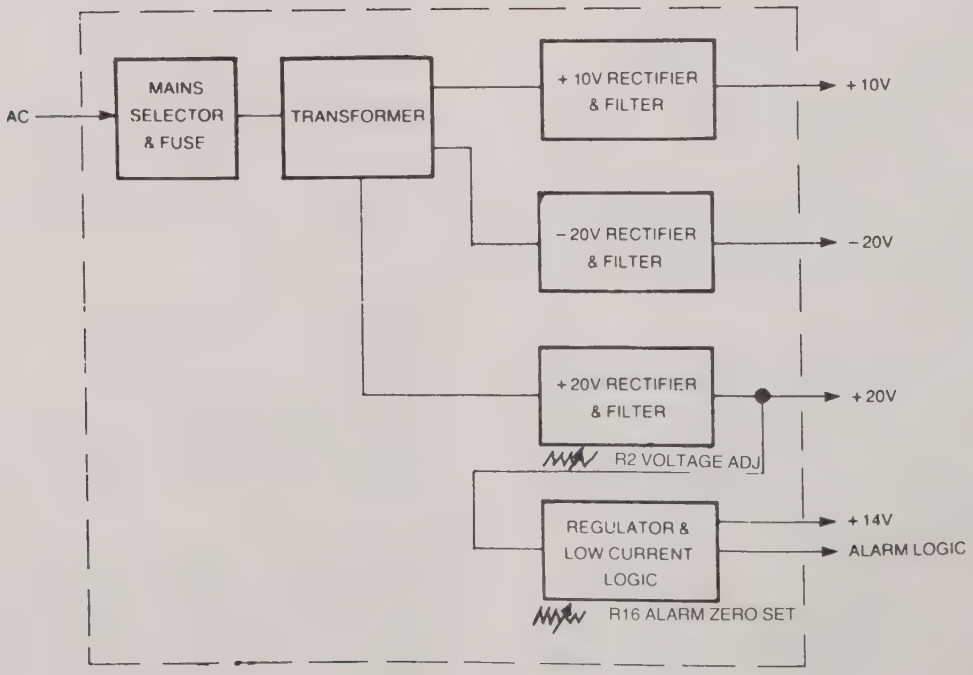


Figure 2-2. Transmitter Power Supply – Functional Block Diagram

still supplying adequately regulated and filtered power to the RF Assembly.

Optional DC Power Supplies are available for operation from −24 Vdc or −48 Vdc power sources.

RECEIVER DIGITAL INTERFACE UNIT

The Receiver Digital Interface Unit is comprised of two main subassemblies: the Receiver Baseband Board and the Receiver Power Supply. The Receiver Baseband Board is configured at the factory for the specdified data rate (T1, T1C, T2, CEPT1, or CEPT2 and interconnection cable length up to 1000 feet). All versions of the Receiver Baseband Board are topologically identical to one another, only component values on the main board, the 40 MHz IF Filter plug-in module, and Cable Equalizer (or Cable Simulator) plug-in boards change from group to group. Functional block diagrams of the carrier recovery and data recovery sections of the Receiver Baseband Board are given in Figures 2-3 and 2-4, respectively.

RECEIVER BASEBAND BOARD

Signal on a 140 MHz carrier is applied to terminal J1, where it is ac coupled into Mixer M1, and converted to a 40 MHz IF. The IF is phase locked to a 10 MHz crystal oscillator through a divide by 4 counter using two "D" latches (U4). Mixers M3 and M4 serve as phase and lock detectors. Mixer M3 drives Loop Filter U5, which in turn generates varactor bias to tune the VCO. If phase lock has not yet been attained, the Loop Filter sweeps the varactor bias over the tuning range (40 MHz) of the VCO. When lock is acquired, there is a dc signal at the IF port of Mixer M4, sweep is disabled, and the desired incoming signal is centered in the 40 MHz IF.

After conversion, the signal is amplified through gain stages made up of Q1, Q2, Q5, and Q6. At Q6, the signal is rectified and filtered through circuitry around U2, and used to control the bias on the gates of GaAs FET Q2 to provide AGC. Signal from the emitter of Q6 is then bandpass filtered by the IF plug on board, and coupled to U3 via autotransformer T2. U3 limits the signal before reaching the delay line demodulator drivers Q14 and Q15. The signal and a delayed version appear at the inputs of Mixer M2, and demodulated baseband data appears at the output. The passive filter following M2 rejects the unwanted 80 and 40 MHz components. At this point, the signal is now at baseband with most of the signal power confined to frequencies below bit rate/2.

Circuitry surrounding U9 and Q16 provide baseband gain before the signal appears at the group delay equalizer U10, which compensates for the phase nonlinearities present in the baseband filters in both the Transmitters and Receivers. After equalization, the signal is low pass filtered by two cascaded Sallen-Key stages. Transistors Q20/Q18 and Q22/Q23 form the unity gain buffers needed in the Sallen-Key topology, while Q19, Q21, and U25 provide bias.

The filtered signal is then ac coupled to comparators U11, U12, and U31. The comparators have their thresholds set via a decision directed feedback loop including U15 and U16. A dc level proportional to the baseband signal level at the comparator inputs is present at the U16 outputs, and the required thresholds are subsequently derived through a resistive voltage divider network. The six comparators operate in pairs to allow detection of the three possible signal states found in AMI code. One pair provides the decision directed AGC estimate (U11 pin 1 and U12 pin 16), a second pair generates a bit rate spectral component for the phase locked loop used in timing recovery (U12 pin 1 and U11 pin 16), and the third pair detects the received data (U31 pins 1 and 16).

The clock recovery phase locked loop is needed in order to make U13 and U14 latch the comparator outputs at the proper time in each cycle of the eye pattern. This occurs when all possible signal trajectories cross through one of three points. Before entering the loop, transistor Q28 provides gain, while the tank on the Q29 collector provides filtering in order to improve the signal to noise ratio into the loop. After limiting, this signal is applied to Mixers M5 and M6 which serve as phase and lock detectors. As in the carrier PLL, one phase detector drives the VCO sweep and lock circuitry, while the other drives the loop filter. The VCO center frequency is tuned to four times the bit rate, and subsequently divided by four to generate the necessary clock phases for proper loop operation. Again, when phase lock is attained, Mixer M6 has a dc output voltage causing the DATA light to come ON and the VCO sweep to STOP. When L19 is properly adjusted, the positive edges of the clock input to U13 and U14 coincide with the eye pattern crossover points. In this way, the comparator outputs are latched at the proper times.

The latches drive the optional descrambler plug-in via ECL to TTL translator U17. If the plug-in is not present, shorting plugs W4, W5, and W6 must be in place. The signal then arrives at U18, which drives the center tapped T1 primary. The output signal is then available on the T1 secondary, as either a single-ended or differential signal depending on the orientation of shorting plugs W1, W2, W5, and W7. Note that some of the noisier IC's in this region of the board run off of their own +5V supply (U30), shown on the schematic as +5V. Additionally, these IC's and their bypasses have their ground returns routed via tracks directly to the "common" terminal of regulator U30 instead allowing the return currents to flow in the ground plane.

Aside from the exception noted above, all power for the board is drawn through regulators U26 through U29. Unregulated power for these regulators comes directly from the power supply through connector J4. Only the −5V power is derived from regulated −12V (U28). Power for the RF Assembly and the radome is also present on the board, and is delivered through TB3 and Fuses F1 and F2.

When the system is configured for actual use, a dc level from the AGC circuitry of the IF Amp in the radome is present on the cable connected to the IF input. Since the 140 MHz carrier is ac coupled to the first mixer, the AGC signal is dc coupled to the meter movement to give a relative indication of receive carrier level.

RECEIVER POWER SUPPLY

AC power is connected to the Power Supply via a mains

selecting plug. To change input supply voltage, the fuse must be removed, then the mains selector card can be removed, oriented for the appropriate voltage and reinserted. Available mains are 100/120, and 220/240 Vac. A functional block diagram of the Receiver Power Supply is given in Figure 2-5.

The ac power input is fused and applied to the primary winding of transformer T1. Multiple secondary taps on the transformer provide outputs into three bridge rectifiers followed by capacitive input filters. The Power Supply produces three unregulated dc outputs (+10, +20, and −20 Vdc).

Optional DC Power Supplies are available for operation from −24 Vdc or −48 Vdc power sources.

DUPLEX RF ASSEMBLY

The MA-23DR Duplex RF Assembly (unprotected) contains the RF branching network, Transmitter RF Circuits, Receiver RF Circuits, and an RFI Board. A functional block diagram of the Duplex RF Assembly is given in Figure 2-6.

RF BRANCHING. The RF branching network of the Duplex RF Assembly allows the simultaneous transmission and reception (duplexing) of microwave signals using a single antenna. The RF branching network uses bandpass filters and unidirectional ferrite circulators to control the flow of microwave energy. The transmit signal is applied to a bandpass filter that is tuned to pass only the desired transmit frequency onto the input/output circulator. The transmit RF signal enters port 2 of the circulator. Within the circulator, the polarity of internal biasing causes the signal to be circulated in one direction until it finds an impedance match. This occurs at the input/output port (port 3) of the circulator where antenna connections are made.

On the receive side, incoming RF signals are received at the same input/output port (port 3) of the circulator and is circulated to port 1 where it leaves the circulator and is sent to a second circulator which has one of its ports (port 1) terminated with a 50 ohm load. Within the second circulator, the incoming RF signal enters port 2 and is circulated to the next port (port 3). If the RF signal is within the passband of the Receiver's bandpass filter, it finds an impedance match at port 3 and leaves the circulator at that point. Then, the RF signal is bandpass filtered and fed to the Receiver RF circuits for processing. However, incoming RF signals that are not within the passband of the Receiver's bandpass filter, are circulated to port 1 and dissipated into a 50 ohm load.

TRANSMITTER RF SECTION (P/O DUPLEX RF ASSEMBLY). The baseband signal from the Transmitter Digital Interface Unit is sent via coaxial cable to a Type F bulkhead connector on the weather-resistant Duplex RF Assembly. The incoming signal is connected to the heatsinked Voltage Regulator Board by a short piece of 75 ohm coaxial cable. The amplitude of the baseband signal is adjusted by variable resistor R4 for a modulation sensitivity of 4 MHz P/V P-P. The baseband signal is then combined with a regulated bias voltage adjusted by R8, and connected to the varactor input on the Transmitter Gunn Source where it directly frequency modulates the 23 GHz carrier. The Gunn Source frequency is set by a large, fine thread screw protruding from the top of the Gunn Oscillator. The Voltage Regulator also supplies bias to the Gunn diode (typically 5V at 1.0A), adjustable by R6. Both Gunn and varactor bias are unique to the individual Transmitter Gunn Source.

RECEIVER RF SECTION (P/O DUPLEX RF ASSEMBLY). The incoming 23 GHz RF signal is routed through the RF branching circuits of the Duplex RF Assembly (described earlier) and applied to the 23 GHz Mixer/Oscillator which is comprised of a temperature stabilized Gunn Local Oscillator and a Waveguide Mixer for downconversion to a nominal 140 MHz IF. The LO frequency is set by a large, fine thread screw protruding through the thermal driver block near the Temperature Control Board. The IF signal is then applied to the 140 MHz Preamplifeir Board where it is amplified and filtered. The overall RF-to-IF gain by the 23 GHz Mixer/Oscillator and 140 MHz Preamplifier combination is approximately 20 dB. The output of the Preamplifier is connected by a short piece of 75 ohm coaxial cable to the input of the AGC'd IF Amplifier where the signal is further amplified to a constant level of −6 dBm. A buffered sample of the AGC voltage appears on the IF output center conductor. The 140 MHz IF and AGC signals are then routed to the Receiver Digital Interface Unit via coaxial interconnection cable.

RFI BOARD. DC power for the Transmitter and Receiver RF circuits of the Duplex RF Assembly are supplied by their respective Digital Interface Units via multiconductor interconnection power cable. The incoming dc voltages are applied to the RFI Board that performas three main functions: power distribution, RFI filtering, and transient suppression. Inductor L1 and capacitor C1 form a low pass filter to remove any RF energy that may be present on the power cables, while ferrite bead Z1 provides transient suppression. At voltages above 47V, Z1 appears as a short circuit. A voltages below 47V, Z1 appears as a moderate sized capacitor.

HOT STANDBY DUPLEX SYSTEM

A functional block diagram of the MA-23DR Hot Standby Duplex System is given in Figure 2-7.

TRANSMITTER AND RECEIVER DIGITAL INTERFACE UNITS. The Transmitter and Receiver Digital Interface Units used in the MA-23DR Hot Standby Duplex System are identical to those used in the unprotected MA-23DR Duplex System described earlier.

AUTOMATIC HOT STANDBY SWITCHOVER UNIT. The Automatic Hot Standby Switchover Unit employs solid-state logic circuits with sensing and alarms to provide uninterrupted transmission of data when operating in the automatic switching mode. The unit allows manual override of the switching logic circits to force the selected Transmitter or Receiver on-line. A loopback feature is incorporated for troubleshooting purposes. The loopback mode can be locally or

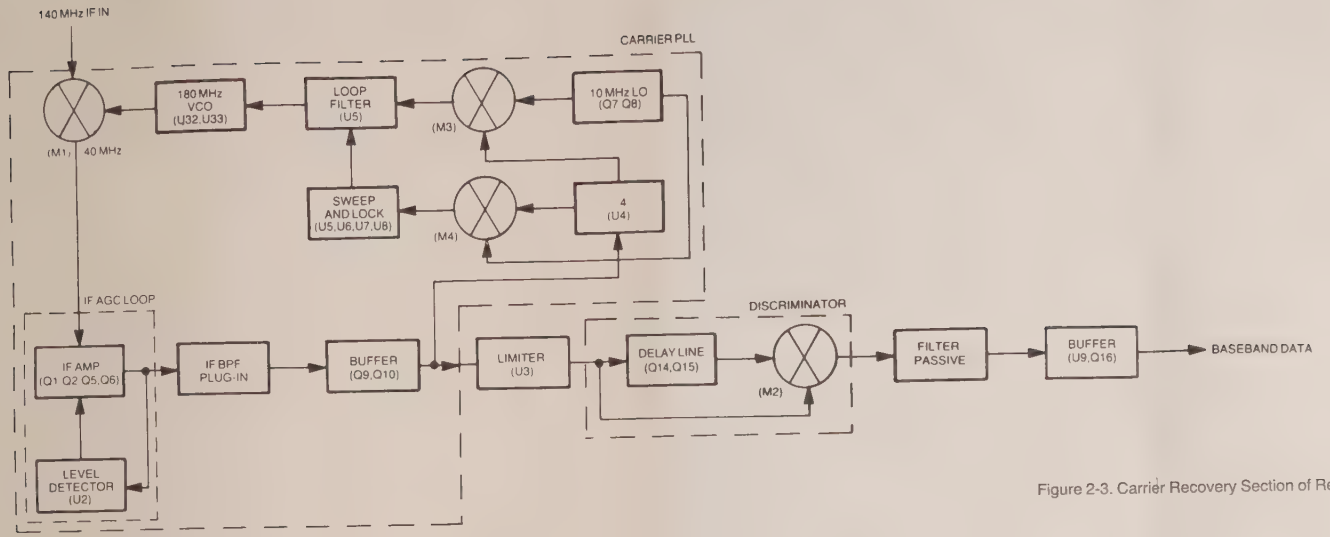


Figure 2-3. Carrier Recovery Section of Receiver Baseband Board

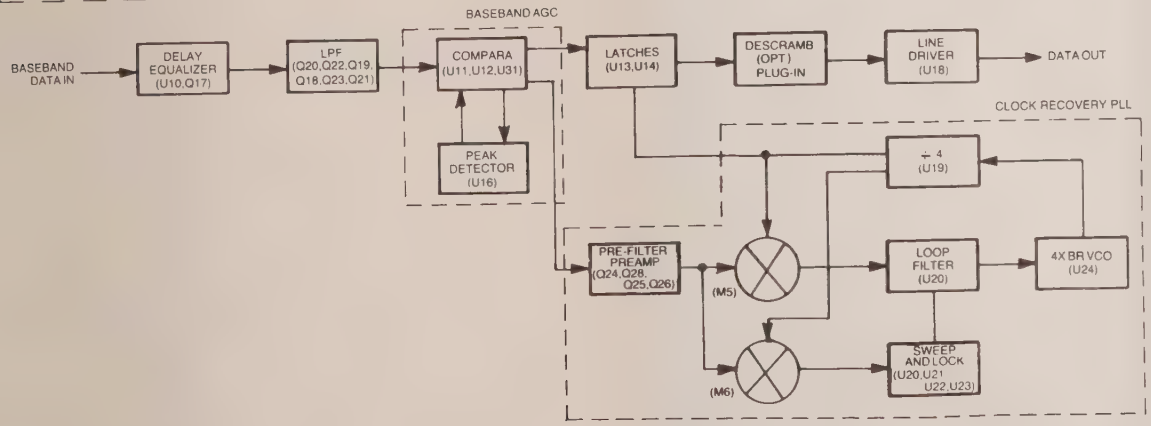


Figure 2-4. Clock Recovery Section of Receiver Baseband Board

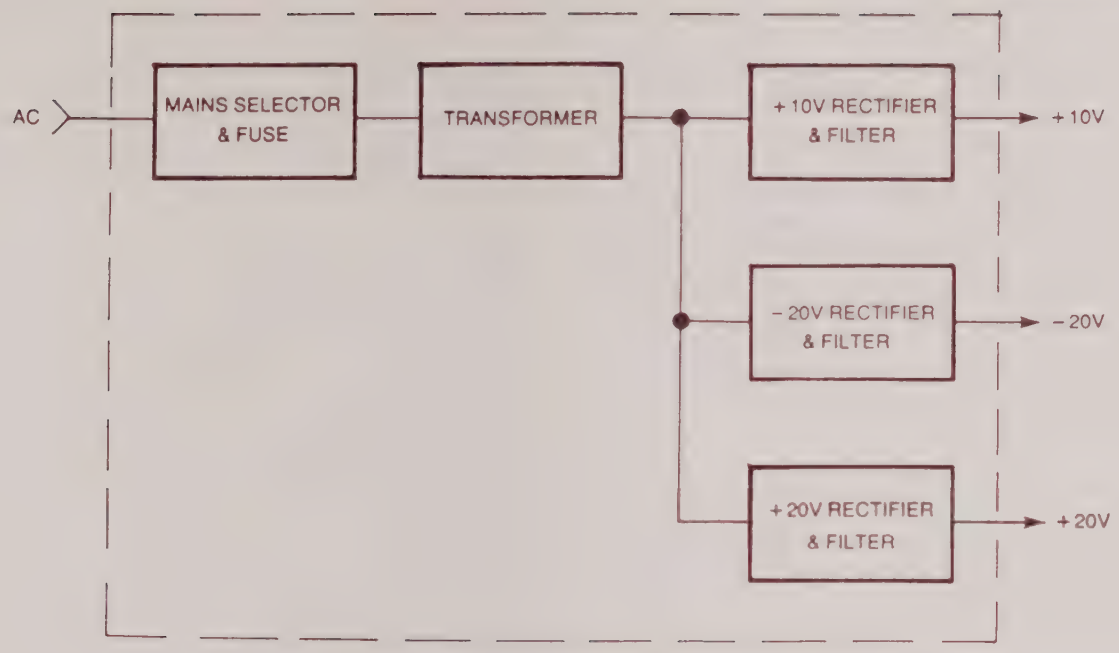


Figure 2-5. Receiver Power Supply – Functional Block Diagram

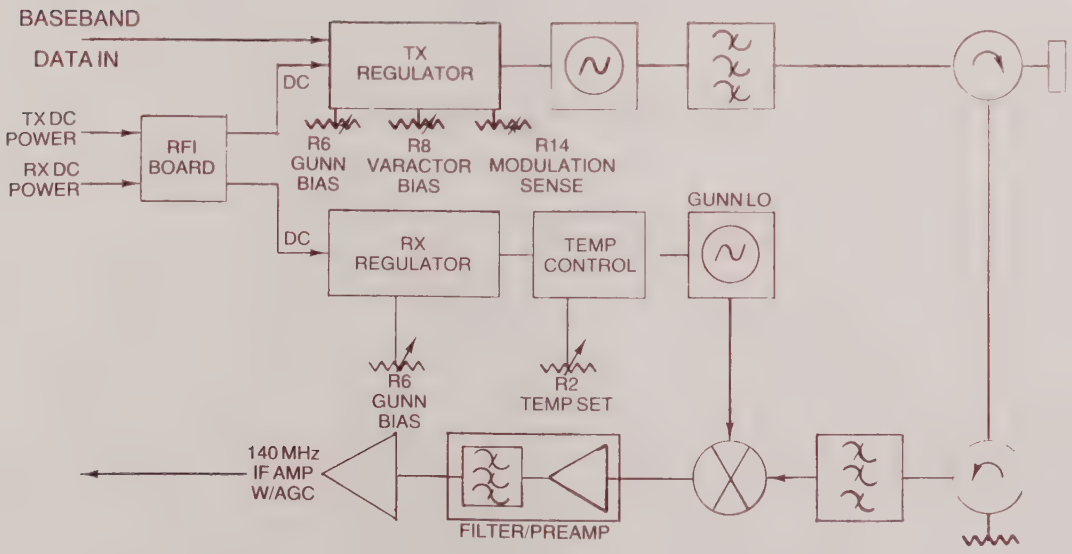


Figure 2-6. Duplex RF Assembly (Unprotected) – Functional Block Diagram

remotely enabled. However, the operator may override a remote loopback command to resume normal operation.

In the automatic switching mode, fault alarms from the Transmitter and Receiver Digital Interface Units initiate logic circuit action to place the standby units on-line. Priority circuits ensure that TX1 and RX1 are on-line if no faults are present. When a Transmitter fault occcurs, an alarm is received from the corresponding Digital Interface Unit and a control signal is sent to the swtiching circuyits of the Hot Standby Transmitter RF Unit to terminate the RF signal of the faulted Transmitter and route the signal of the standby unit to the antenna. The procedure is similar on the receive side except that switching action takes place in the baseband switch of the Automatic Hot Standby Switchover Unit.

On the transmit side, incoming data signals are fed to a 6 dB splitter and routed to their respective Transmitter Digital Interface Units for processing. On the receive side, the baseband signals received from the Receiver Digital Interface Units are fed to a baseband switch. The baseband swtich responds to a command signal from the logic circuits to pass the baseband output of the selected Receiver Digital Interface Unit.

The Automatic Hot Standby Switchover Unit contains a dc/dc converter for operation from dc power sources (ac powered units are optionally available). This unit powers the Switchover logic and switching circuits as well as the Hot Standby Transmitter RF switching circuits.

When equipped with optional BER cards, the unit provides external alarms if the bit error rate exceeds permissible limits.

HOT STANDBY DUPLEX RF ASSEMBLY. The MA-23DR Hot Standby Duplex RF Assembly consists of two weather-resistant RF units designed for pole or tower mounting, a Hot Standby Transmitter RF Unit and a Hot Standby Receiver RF Unit. These units utilize the proven RF components of MA-23DR systems.

The Hot Standby Transmitter RF Unit contains two Gunn Oscillators modulated by baseband signals arriving at two separate baseband input connectors. The modulated 23 GHz outputs of the Gunn Oscillators are fed via terminated circulators to a waveguide switch. The waveguide switch is driven by a control signal from the Hot Standby Switchover Unit and routes RF energy from the on-line Gunn oscillator to the antenna while terminating the signal of the standby Gunn into a dummy load. The Transmitter RF Unit also contains the branching circulator used for duplexing. DC power and waveguide switch control signals are received from the Automatic Hot Standby Switchover Unit.

The Hot Standby Receiver RF Unit contains two Receiver/IF chains connected in parallel. The incoming RF signal from the branching circulator located in the TX RF Unit is applied to a waveguide splitter and distributed to both Receiver/IF chains. Within each chain, the RF signal is fed via terminated circulators to the mixer where it is heterodyned with Gunn local oscillator signal to produce a 140 MHz Receiver IF signal. The IF signal is fed through a preamplifier stage to an AGC'd IF Amplifier. The 140 MHz IF output of each Receiver/IF chain is fed through a separate connector to its associated Receiver Digital Interface Unit. DC power for the Hot Standby Receiver RF Unit is received from the Receiver Digital Interface Units.

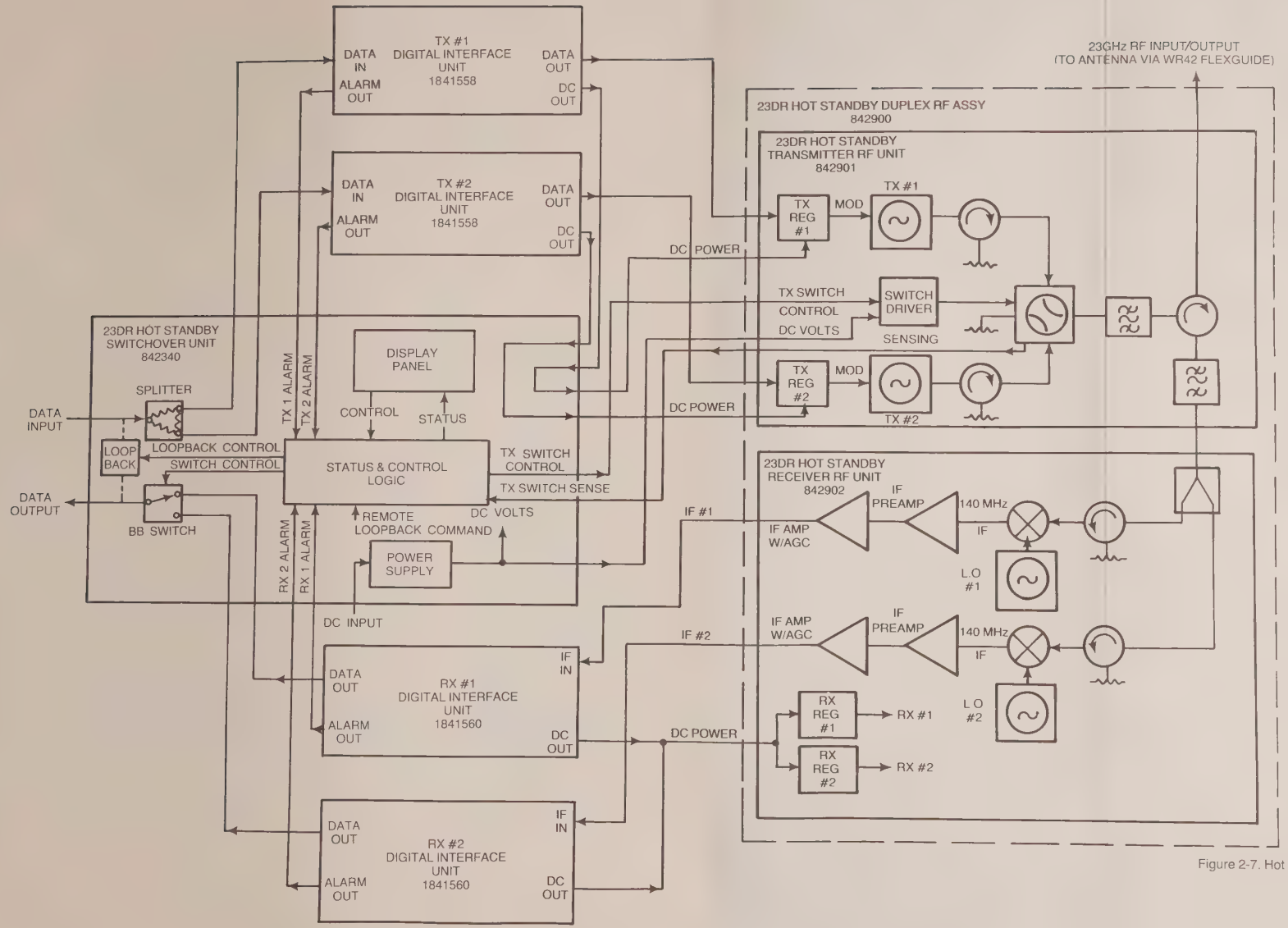


Figure 2-7. Hot Standby Duplex System – Functional Block Diagram

MAINTENANCE LOG. Record all measurements and corrective action taken in a maintenance log as reference information for use in future alignment, maintenance, and troubleshooting.

NOTE

FCC Rules and Regulations mandate that whenever measurements or adjustments are performed that may affect the frequency, power, or modulation of the radio system, pre- and post-measure measurements of the latter must be entered in the FCC Station Log. Also, a log entry must be made any time the Transmitter is removed from service, or restored to service.

INTERNAL CONTROLS, INDICATORS, AND TEST POINTS

Internal controls, indicators, and test points are listed in Tables 3-2 through 3-5.

Table 3-2. Transmitter Digital Interface Unit – Internal Controls

REF DES	FUNCTION
TRANSMITTER BASEBAND BOARD PN 1841556	
R69	Output amplifier dc balance.
W1	DATA IN connector selector.
W2	DATA IN connector selector.
W4	Optional scrambler jumper.
W5	Optional scrambler jumper.
TP1	Data input test point.
TP2	Not Used.
TP3	+5V test point.
TP4	−12V test point.
TP5	Trasmit eye pattern.
TP6	+12V test point.
TP7	Ground.
F1	+ dc power fuse, 2A
TRANSMITTER POWER SUPPLY BOARD PN 1841570-2	
R2	+14V output voltage adjustment.
R16	Alarm threshold adjustment.
Fuse	120 Vac nominal input (1.0A slo-blo) or 220 Vac nominal input (0.5A slo-blo).
Mains Selector	Selects 100/120 Vac or 220/240 Vac operation.

Table 3-3. Transmitter RF Box Assembly – Internal Controls

REF DES	FUNCTION
VOLTAGE REGULATOR BOARD PN 1841788-2	
R6	Gunn bias adjustment.
R8	Varactor bias adjustment.
R14	Modulation sensitivity adjustment.
E2	Gunn voltage test point (5V typical).
E4	Baseband input test point (2V P-P typical).
E10	Varactor bias test point (5V typical).

Table 3-4. Receiver Digital Interface Unit – Internal Controls

REF DES	FUNCTION
RECEIVER BASEBAND BOARD PN 1841562	
L12	180 MHz VCO frequency adjustment.
R108	Baseband level adjustment.
R218	Carrier recovery sweep speed symmetry adjustment.
R221	Clock recovery sweep speed symmetry adjustment.
L19	Clock recovery phase adjustment.
L20	Clock recovery VCO frequency adjustment.
W1,W2, W5,W7	DATA OUT connector selection (75 ohm coaxial or 100 ohm balanced).
W3	Summary alarm relay function select.
W4,W6	Optional descrambler jumpers.
TP1	Received eye pattern.
TP2	Recovered clock test point.
TP3	+5V test point.
TP4	+12V test point.
TP5	−12V test point.
TP6	Ground.
F1	+ dc power fuse, 2A.
F2	− dc power fuse, 0.5A.
40 MHz IF FILTER PLUG-IN BOARD PN 1841578	
L1,L2,L3	IF Filter tuning.
RECEIVER POWER SUPPLY BOARD PN 1841570-1	
Fuse	120 Vac nominal input (1.0A slo-blo) or 220 Vac nominal input (0.5A slo-blo).
Mains Selector	Selects 100/200 Vac or 220/240 Vac operation.

Table 3-5. Receiver RF Box Assembly – Internal Controls

REF DES	FUNCTION
VOLTAGE REGULATOR BOARD PN 1841788-1	
R6	Gunn bias voltage adjustment.
E1	Auxiliary AGC test point.
E2	Gunn voltage test point.
E5	−12V test point.
E10	+12V test point.
LO TEMPERATURE CONTROL BOARD PN 1842102	
R2	Temperature set point.
140 MHz PREAMPLIFIER BOARD PN 1841936	
C12,L4,L10, L5,L8,L6,L11, L7,C20,C21	IF Filter tuning.
W1	Factory test jumper.
IF AMPLIFIER BOARD PN 1841930	
L1,L2,L3,L4	IF Amplifier tuning.

ALIGNMENT PROCEDURES

POWER CHECKOUT. Both MA-23DR Transmitter and Receiver Subsystems operate from 120/240 Vac mains. The Transmitter and Receiver Digital Interface Units power their respective RF Box Assemlbies via interconnecting power cables.

CAUTION

Disconnect Digital Interface Units from ac mains when installing or removing circuit boards or making any other repairs.

Perform the following procedures with the signal and power interconnection cables installed on the Interface Units. Do not connect to Transmitter or Receiver RF Box until later.

TRANSMITTER DIGITAL INTERFACE UNIT POWER CHECKOUT

Step 1. Verify that the Interface Unit is configured for the correct line power (100/120 Vac or 220/240 Vac) by inspecting the Mains Selector Card and ac fuse located on the rear panel of the unit.

Step 2. Remove top cover of Interface Unit secured by 9 screws for access to internal controls and test points.

Step 3. Connect the ac power cord and apply power to unit. Since the unit is designed for continuous operation, there is no power switch.

Step 4. Using a DVM, make the following checks on connector J2 of the Transmitter Baseband circuit board. Pin 1: +18V unregulated; Pins 2,3: +10V unregulated; Pin 8: −18V unregulated.

NOTE

Do not check Transmitter RF Box supply voltage until later. This voltage will be measured at the RF Box when it is added to the system.

RECEIVER DIGITAL INTERFACE UNIT POWER CHECKOUT.

Step 1. Verify that the Interface Unit is configured for the correct line power (100/120 Vac or 220/240 Vac) by inspecting the Mains Selector Card and ac fuse located on the rear panel of the unit.

Step 2. Remove top cover of Interface Unit secured by 9 screws for access to internal controls and test points.

Step 3. Connect the ac power cord and apply power to unit. Since the unit is designed for continuous operation, there is no power switch.

Step 4. Using a DVM, make the following checks on connector J4 of the Receiver Baseband circuit board. Pin 1: +20V unregulated; Pins 2,3: +10V unregulated; Pin 8: −20V unregulated.

NOTE

Do not check Receiver RF Box supply voltage until later. This voltage will be measured at the RF Box when it is added to the system.

TRANSMITTER DIGITAL INTERFACE UNIT ALIGNMENT

Step 1. Consult system data requirements and verify that the correct Transmitter Baseband (main) Board and plug-in Line Equalizer Board are installed (refer to recommended spares list in Section 4).

Step 2. If equipped with an optional plug-in Scrambler Board, remove it until later and install jumpers W4 and W5 as follows: install W4 between E9 and E10; W5 between E11 and E12.

Step 3. The Transmitter can be configured to accept either 75 ohm coaxial or balanced data inputs (Table 3-6) by moving jumpers.

For balanced input at TP3, install W1 between E1 and E3 and W2 between E4 and E6. For 75 ohm coaxial input at J6, install W1 between E2 and E3 and W2 between E5 and E6.

Step 4. Check Transmitter Baseband Circuit board on-card three-terminal voltage regulators:

U1 Output: −5 ± 0.25 Vdc
U2 Output (at TP4): −12 ± 0.6 Vdc
U3 Output (at TP3): +5 ± 0.25 Vdc
U4 Output (at TP6): +12 ± 0.6 Vdc
(TP7 = chassis ground)

Step 5. Using test setup shown in Figure 3-1, configure the RF signal generator (PAL data rates only) and pattern generator per the following table (Table 3-7).

Step 6. Set the step attenuator to 0 dB and observe that all POWER, GUNN, and DATA indicators light.

Step 7. Connect the 10X probe to the unused channel of the scope and observe the waveform present at TP1 of the Baseband board and observe that the waveform has a symmetrical, rectangular shape as shown in Figure 3-2 indicating that data is present at the input of the level slicing circuitry of the board.

Higher frequency components (small ripples) may be present in the waveform, which is normal.

Step 8. Disconnect the cable from the data output of the pattern generator. Monitoring the DATA OUTput (at J4) of the Digital Interface Unit with a DVM and adjust R69 for a reading of 0V. Reconnect the cable.

Step 9. Connect scope to DATA OUTput (J4) via a 75 ohm termination and observe eye pattern as shown in Figure 3-3. The eye pattern waveform should be perfectly symmetrical and the three convergent points should be tight.

Peak-to-peak voltages should be measured as follows:

T1 (1.544 Mbps)	0.415V P-P
CEPT1 (2.048 Mbps)	0.551V P-P
T1C (3.152 Mbps)	0.849V P-P
T2 (6.312 Mbps)	1.70V P-P
CEPT2 (8.448 Mbps)	2.27V P-P

Step 10. Set the step attenuator to 10 dB. Observe that all LED indicators stay on and the eye pattern waveform remains unchanged. Increase attenuation to 20 dB and observe that the DATA indicator extinguishes.

Remove all test equipment.

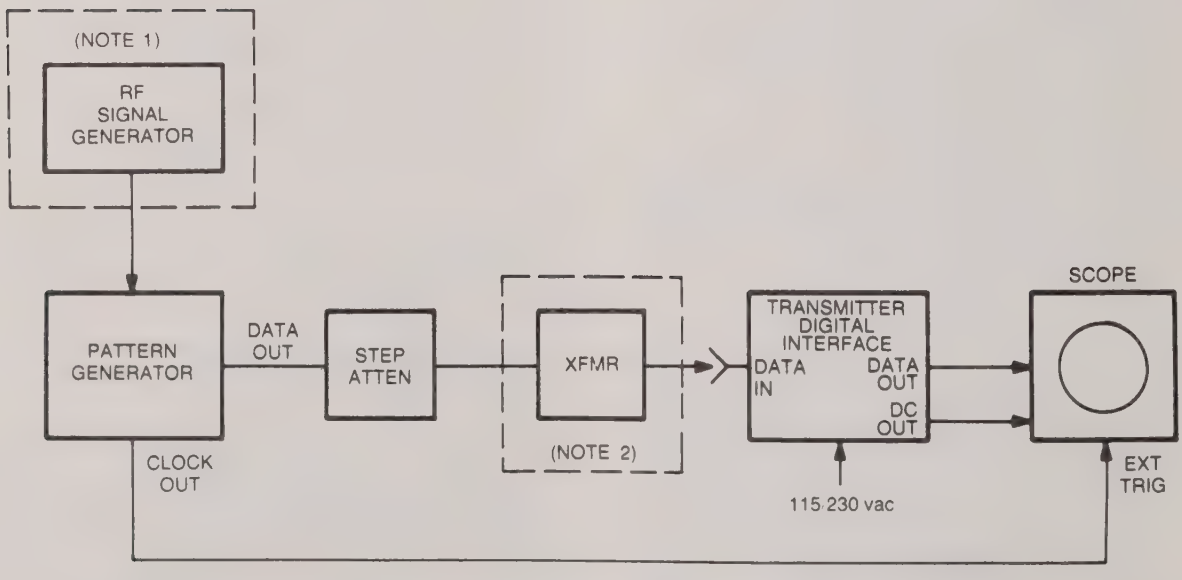
Table 3-6. Balanced Input Impedance

DATA RATE	BALANCED INPUT
T1,T1C	100 Ohms
T2	110 Ohms
CEPT1	120 Ohms
CEPT2	150 Ohms

Table 3-7. Test Equipment Setup
(RF Signal Generator and Pattern Generator)

DATA RATE (Mbps)	T1 1.544	CEPT1 2.048	T1C 3.152	T2 6.312	CEPT2 8448
RF Frequency (MHz)*	N/A	2.048	N/A	N/A	8.448
RF Level (dBm)*	N/A	+20	N/A	N/A	+20
Word Pattern	PRBS n = 20 2n – 1				
Zeroes	NORM				
Frequency	NORM	EXT	NORM	NORM	EXT
Output Format	AMI CLOCK				
Frequency	F1	N/A	F2	F3	N/A

*RF signal generator (PAL data rates only).



NOTES:1. RF SIGNAL GENERATOR USED FOR PAL (CEPT 1, CEPT 2) DATA RATES ONLY
2. UNBAL-BAL TRANSFORMER REQUIRED WHEN BALANCED DATA INPUT (TB3) OF TX INTERFACE IS USED.NOT REQUIRED WHEN 75Ω COAXIAL INPUT (J6) IS USED.

Figure 3-1. Transmitter Digital Test Configuration

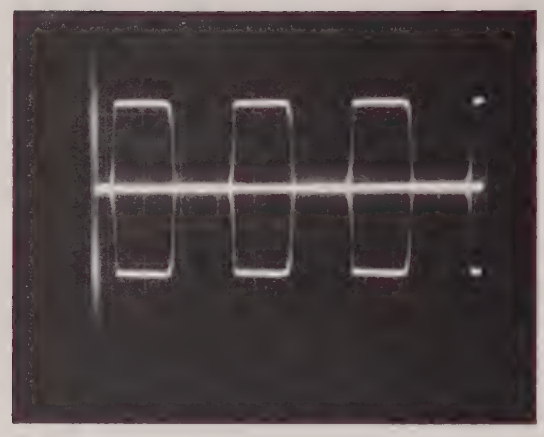


Figure 3-2. Input Data Waveform

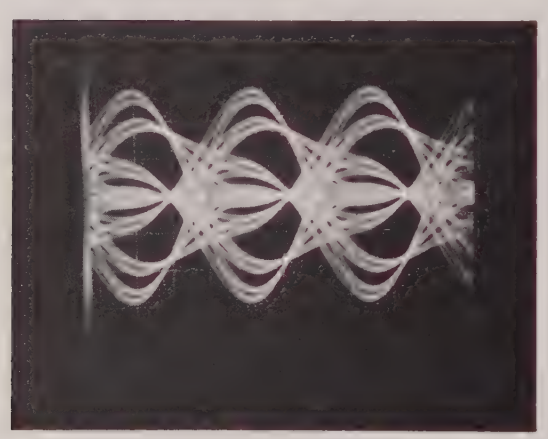


Figure 3-3. Eye Pattern Waveform

ALARM RELAY CHECK. Summary alarm relay contacts are available at the 15 pin, D-Type panel connector (J7) at the rear of the Transmitter Interface Unit (Table 3-8).

1. Check for continuity between pins 3 and 11 of J7 (alarm condition).

2. On Transmitter Baseband Circuit board, apply +4 Vdc to Pin 10 of connector J2 and check for continuity between pins 4 and 11 of J7. Observe that GUNN indicator (DS3) lights.

Table 3-8. Alarm Relay Contacts

CONDITION	ALARM RELAY CONTACTS	
	J7 (PINS 3 AND 11)	J7 (PINS 4 AND 11)
Normal	Open	Closed
Summary Alarm (Power, Data, or Fault)	Closed	Open

TRANSMITTER RF BOX ALIGNMENT

Step 1. Connect the Transmitter RF output through a directional coupler to path loss test attenuators as shown in Figure 3-4 and connect the power interconnection cable from the Transmitter Baseband Unit to the POWER IN connector J3.

NOTE

Do not connect the Reciver RF Box at this time.

Step 2. Open the door of the Transmitter RF Box for access to internal controls and test points.

Step 3. Using DVM, measure dc supply voltage from Transmitter Baseband Unit at pins G and H of POWER connector J3 (specification: +14 Vdc ± 1.0 Vdc).

Step 4. Gunn diode and varactor diode bias voltages are marked on the side of the Gunn Source. Check these voltages at connector J1 of the Transmitter Voltage Regulator board as follows:

a. Gunn Bias Voltage: connect a DVM between ground and pin 4 of J1. If necessary, adjust R6 on the board for the correct voltage.

b. Varactor Bias Voltage: connect a DVM between ground and pin 1 of J1. If necessary, adjust R8 on the board for the correct voltage.

Step 5. Connect a microwave frequency counter to the directional coupler output port and allow the Gunn Source to warm up for approximately 10 minutes.

Step 6. Measure the Transmitter frequency (specification: within ±7 MHz of assigned frequency). If necessary, loosen the setscrew locking collar on the Gunn Source and adjust the frequency tuning setscrew for the assigned Transmitter frequency, then tighten the locking collar. It may be necessary to repeat this step several times due to mechanical interaction between the locking collar and the setscrew.

Step 7. Replace the frequency counter at the directional coupler output port with a power meter and measure the RF power output level (specification: 18 ± 1 dBm). Be sure to include directional coupler loss for this measurement.

RECEIVER RF BOX ALIGNMENT

Step 1. Connect the interconnection power cable from the Receiver Baseband Unit to POWER connector J3 on the Receiver RF Box.

Step 2. Open the door of the Receiver RF Box for access to internal controls and test points.

Step 3. Using DVM, measure dc supply voltages from the Receiver Baseband Unit at POWER connector J3 as follows:

a. At Pins B and C of J3: check for +20 Vdc ± 1.0 Vdc.

b. At Pin D of J3: check for −20 Vdc ± 1.0 Vdc.

Step 4. Allow the unit to operate for one hour until thermal equilibrium is reached.

Step 5. The Gunn diode bias voltage is marked on the side of the Gunn Oscillator. Check this voltage at pin 4 of J1 on the Receiver Voltage Regulator board. If necessary, adjust R6 on the board for the correct voltage.

Step 6. Connect the waveguide noise source through a 10 dB waveguide attenuator to the waveguide port of the Receiver RF Box (Figure 3-5).

Step 7. Disconnect the F cable from the 140 MHz output (J1) of the Mixer/Oscillator/Preamplifier assembly and connect J1 through a 50 to 75 ohm transit pad to the input of the noise figure meter. Measure the noise figure (spec: less than or equal to 12 dB).

Step 8. Disconnect the noise generator and noise figure meter and restore the F cable to its original position at J1 of the Mixer/Oscillator/Preamplifier assembly.

Step 9. Connect the Receiver RF Box to the Transmitter RF Box via the path loss test attenuators and connect a frequency counter to the IF OUT connector of the Receiver RF Box.

Step 10. Set the waveguide variable attenuator to 0 dBm attenuation (60 dB total path loss) and apply power to the Transmitter.

Step 11. The IF frequency should read 140 MHz ± 7 MHz on the counter. If not, it will be necessary to adjust the frequency of the Receiver Gunn Oscillator per the following procedure.

RECEIVER GUNN OSCILLATOR FREQUENCY ADJUSTMENT PROCEDURES

CAUTION

Frequency adjustment of the Receiver Gunn Oscillator should be performed only by factory trained technicians.

One of two methods can be used to adjust the frequency of the Receiver Gunn Oscillator depending on the test equipment that is available. Method A is the preferred method which requires a high frequency counter to measure the Receiver Gunn Oscillator frequency directly. Method B uses a spectrum analyzer to view the sidebands of the 140 MHz IF signal. When Method B is used, it may be difficult to determine whether the Gunn Oscillator frequency is set 140 MHz above or 140 MHz below the carrier frequency.

Receiver Frequency Adjustment Procedure (Method

Step 1. If the system is duplex, disable the Transmitter Gunn Source by disconnecting J1 on the Transmitter Voltage Regulator card in the RF Assembly.

Step 2. Locate the circulator with a waveguide termination and remove the termination (secured by four screws).

Step 3. Using a waveguide-to-SMA adaptor, connect a 23 GHz frequency counter to the open circulator port to measure the frequency of the Receiver Gunn Oscillator.

Step 4. At this point, it is necessary to determine if the Receiver Gunn Oscillator should be set on the high side of the carrier (i.e., 140 MHz above the carrier frequency) or on the low side of the carrier (i.e., 140 MHz below the carrier frequency). Tune the Receiver Gunn Oscillator accordingly using the tuning screw.

NOTE

The LO has a very sensitive tuning slug (approximately 1200 MHz per turn), so turn very slowly.

Step 5. Replace the waveguide termination on the circulator. Be sure that the waveguide openings are correctly oriented.

Step 6. If the system is duplex, restore power to the Transmitter Gunn Source by connecting J1 on the Transmitter Voltage Regulator Board.

Receiver Frequency Adjustment Procedure (Method B)

Step 1. Replace the counter with a spectrum analyzer at the IF OUT connector of the Receiver. Setup the spectrum analyzer as follows:

Frequency:	140 MHz
Input Attenuation:	10 dB
Reference Level:	0 dBm
Frequency Span:	20 MHz/div

Step 2. At this point, it must be determined if the Receiver Gunn Oscillator's LO signal is set 140 MHz above or 140 MHz below the carrier frequency. If on the high side, perform Part A; if on the low side, perform Part B.

a. Part A, High Side LO Tuning: Tune the RX Gunn Oscillator until a sideband is seen on the spectrum analyzer that decreases in frequency as the tuning screw is turned clockwise (LO frequency decreasing).

b. Part B, Low Side LO Tuning: Tune the RX Gunn Oscillator until a sideband is seen on the spectrum analyzer that increases in frequency as the tuning screw is turned clockwise (LO frequency decreasing).

Step 3. Center the sideband at 140 MHz on the spectrum analyzer. In the event that multiple sidebands are seen, select the strongest, most noise-free, sideband (−6 dBm level at IF OUT).

Step 4. Disconnect the spectrum analyzer from the IF OUT connector and replace with the frequency counter. Adjust the RX Gunn tuning screw until the IF frequency is 140 MHz ± 7 MHz, then seal the tuning screw with "Vibratight."

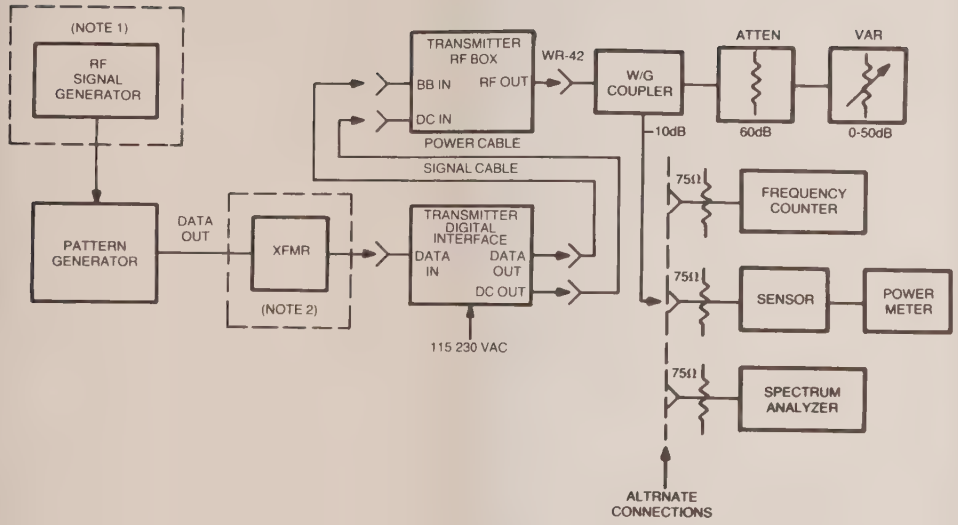


Figure 3-4. Transmit RF Box Test Configuration

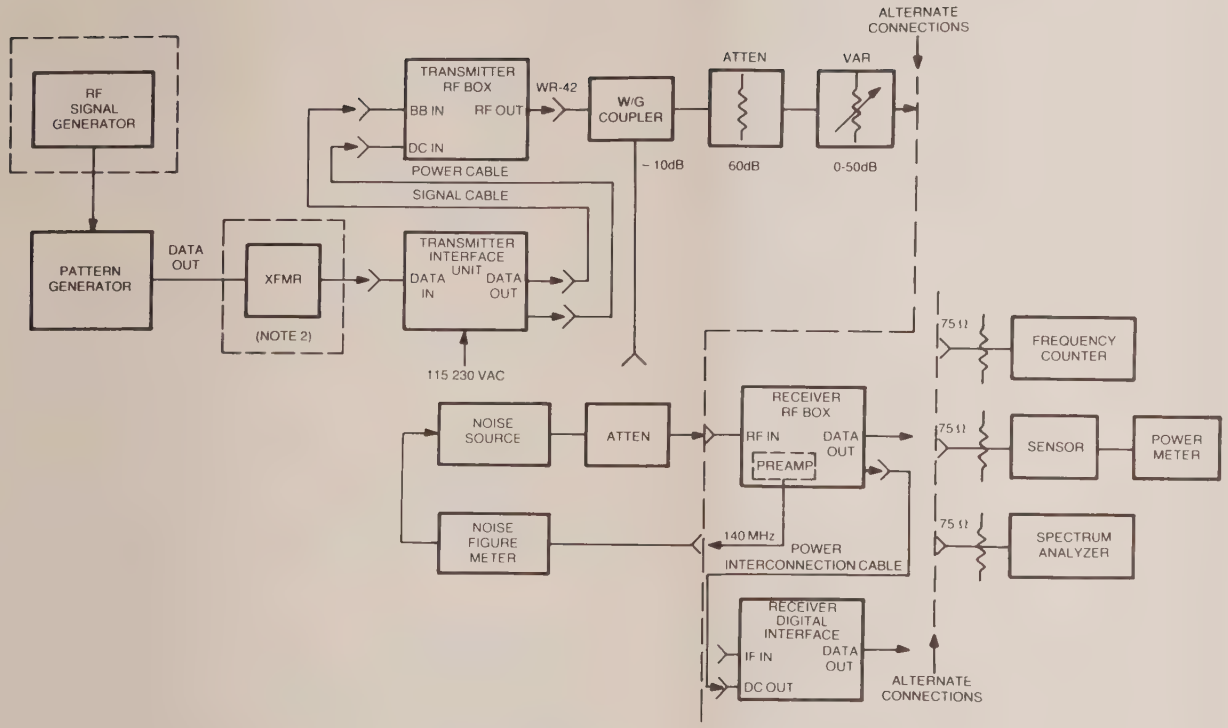


Figure 3-5. Receiver RF Box Test Configuration

TRANSMITTER RF BOX DEVIATION ADJUSTMENT

Step 1. Disconnect the frequency counter from the Receiver IF OUT connector and replace with spectrum analyzer.

Step 2. Connect a signal generator to the BASEBAND IN connector on the Transmitter RF box and inject a 761 kHz signal at 1.9V P-P.

Step 3. Observe the spectrum analyzer for a carrier null with sidebands. If the carrier is not nulled, turn the ceviation adjust potentiometer R14 on the Transmitter Voltage Regulator board all the way counterclockwise. Adjust the resolution of the analyzer as necessary to distinguish the sidebands from the carrier. Center the 140 MHz carrier on the spectrum analyzer and slowly adjust R14 until the carrier goes through two nulls. The Transmitter power is now in the sidebands and deviation is properly set.

NOTE

This procedure sets Transmitter deviation for either data or video traffic without the need for further adjustment.

RECEIVER RF BOX IF OUTPUT LEVEL

Step 1. Connect a power meter to the Receiver RF Box IF OUT connector via a transit pad.

Step 2. Set the variable attenuator to 0 dB (60 dB total path loss) and check that 140 MHz IF output level is −6 dBm ± 1 dBM.

Step 3. Increase the attenuation of the variable attenuator until the IF level drops by 1 dB. This should occur at a variable attenuator setting of 39 dB ± 5 dB (99 dB ± 5 dB total path loss).

Step 4. Set the variable attenuator back to 0 dBm.

RECEIVER DIGITAL INTERFACE UNIT ALIGNMENT

Step 1. Consult system data requirements and verify that the correct Receiver Baseband (main) Board and plug-in 40 MHz IF Filter Board are installed (refer to recommended spares list in Section 4).

Step 2. If equipped with an optional plug-in Descrambler board, remove it until later and install jumpers W4 and W6 as follows: install W4 between E22 and E38, W6 between E28 and E37.

Step 3. The Receiver can be configured to provide either 75 ohms coaxial or balanced data outputs (Table 3-9) by moving jumpers.

For balanced ouptut at TB1, install W1 between E8 and E9, W2 between E11 and E12, W5 between E4 and E5, and W7 between E6 and E7. For 75 ohm coaxial output at J2, install W1 between E8 and E10, W2 between E11 and E13, and remove W5 and W7.

Step 4. Disable the data alarm by placing jumper plug W3 between E1 and E3. The carrier alarm remains active.

Step 5. Check Receiver Baseband Circuit board on-card three-terminal voltage regulators:

U25 Output: +9.3 ± 0.5 Vdc
U26 Output (at TP4): +12 ± 0.6 Vdc
U27 Output (at TP5): −12 ± 0.6 Vdc
U28 Output: −5 ± 0.25 Vdc
U29 Output (at TP3): +5 ± 0.25 Vdc
U30 Output: +5 ± 0.25 Vdc
(TP6 = chassis ground)

Step 6. Connect a network analyzer to 140 MHz IF INput (J1). Setup the analyzer for 140 MHz center frequency, ±25 MHz sweep and measure return loss (less than 15 dB across bandwidth).

Table 3-9. Balanced Output Impedance

DATA RATE	BALANCED INPUT
T1,T1C	100 Ohms
T2	110 Ohms
CEPT1	120 Ohms
CEPT2	150 Ohms

180 MHz VCO ALIGNMENT

Step 1. Replace the network analyzer at J1 with a spectrum analyzer calibrated at 180 MHz. Setup the spectrum analyzer as follows:

Center Frequency	180 MHz
Input Attenuation	10 dB
Reference Level	0 dBm
Scale	10 MHz/div.

Step 2. Observe the VCO sweeping at a level ranging from −40 to −70 dBm. Center the VCO sweep at 180 MHz by adjusting L20. Check that sweep excursions are ±20 MHz and that no discontinuities are seen.

NOTE

The CARRIER lock indicator should not light during this test.

Step 3. Disable the VCO sweep by grounding pin 7 of U7. The CARRIER indicator should light and the sweep excursions should stop except for a very slow drift caused by circuit offset voltages. Adjust R128 to cancel drift.

If CARRIER goes off screen before adjustment can be made, momentarily remove ground from pin 7 to allow sweep circuit to bring the VCO back into range, then adjust R128.

40 MHz IF AGC CHECK

Step 1. Disconnect the spectrum analyzer from J1 and connect the 140 MHz IF output of the Receiver RF Box to J1 through a step attenuator as shown in Figure 3-6.

Step 2. Set the attenuator for 0 dB attenuation and observe that the CARRIER indicator lights. Using a DVM, monitor the voltage across R13. It should be approximately −2.5V. Step the attenuator from 0 to 10 dB and observe that the voltage across R13 follows along in a positive direction to approximately −2.3V. Step the attenuator to 60 dB and observe that the voltage across R13 never goes less negative than −1.5V and the CARRIER indicator extinguishes.

Step 3. Reset the attenuator to 0 dB. Connect the DVM to the drain of Q2. Use a 10K ohm, 1/4W resistor in series with the probe tip to prevent this stage from oscillating. The DVM should measure +5 ± 0.5V at this point. Step the attenuator from 0 to 10 dB and observe that the DVM reading does not change.

Step 4. Reset the attenuator to 0 dB and disconnect the 140 MHz IF output of the Receiver RF Box from the attenuator.

BIT SYNCH VCO ALIGNMENT

Step 1. Connect a frequency counter to pin 3 of U24 via a 10X probe and temporarily ground the anode of VCO varactor diode CR14. Tune the VCO to four times the bit rate (Table 3-10) by adjusting L20.

Step 2. Remove the ground from the VCO varactor and connect the 140 MHz IF output of the Receiver RF Box to the attenuator.

Step 3. Set the pattern generator to WORD 0000 and observe that the CARRIER indicator lights but the DATA indicator is extinguished.

Step 4. Connect the scope to the anode of the VCO varactor CR14 and observe a triangular waveform sweep on the scope at a frequency of approximately 2 Hz at an amplitude of 6V P-P.

Step 5. Set the pattern generator word to PRBS n = 20 and observe that the sweeping stops, the scope shows a dc level, and the DATA indictor lights.

If necessary, adjust L19 to acquire lock.

Step 6. After lock is achieved, adjust L20 for 0 Vdc ± 50 mV at the anode of CR14. Disconnect the scope.

Step 7. Set pattern generator to WORD 0000 and observe that the DATA indicator extinguishes.

Step 8. Connect the spectrum analyzer to pin 3 of U20 using the 10X probe. Center the analyzer to four times the bit rate and set resolution to 10 kHz/division. Adjust R220 for symmetrical sweep speed in both directions.

If no difference is seen while adjusting R220, set the potentiometer to mid position. Disconnect the analyzer.

Table 3-10. VCO Tuning

DATA RATE (Mbps)	4X RATE (MHz)
T1 (1.544)	6.176
CEPT1 (2.048)	8.192
T1C (3.152)	12.608
T2 (6.312)	25.248
CEPT2 (8.448)	33.792

VCO PHASE ADJUSTMENT

Step 1. Set the pattern generator word to PRBS n = 20. Connect the scope to the negative lead of C83 and observe the eye pattern as shown in Figure 3-7. The eye pattern waveform should be perfectly symmetrical and the three convergent points should be tight.

Step 2. Adjust R109 for a baseband level of approximately 1V P-P. Connect a DVM between ground (TP6) and the C84 side os R235. Peak L19 for maximum voltage, then adjust R108 for a dc level of +1.94 ± 0.01 Vdc.

Step 3. Verify that the VCO phase is correct by connecting the baseband eye pattern to one scope channel and the VCO clock, from pin 9 of U13, to the other channel. Set the scope to alternating sweep and trigger from the VCO clock. The rising edge of the clock should go through the center of the eye opening as shown in Figure 3-8. If necessary, adjust L19.

ALARM RELAY CHECK. Summary alarm relay contacts are available at the 15 pin, D-Type panel connector (J5) at the rear of the Receiver Interface Unit (Table 3-11).

Step 1. Remove jumper plug W3 from between terminals E1 and E3 (alarm = out-of-lock), and install between terminals E1 and E2 (alarm = out-of-lock or no data).

Step 2. Simulate faults, then observe condition of LED indicators and check continuity of relay contacts at J5.

a. Simulate power fault by disconnecting power from the unit. Observe that all indicators extinguish and check continuity of relay contacts (alarm condition). Restore power to unit.

b. Simulate data fault by setting pattern generator to WORD 0000. Observe that DATA indicator (DS3) goes out and check continuity of relay contacts (alarm condition). Restpre data.

c. Simulate carrier fault by disconnecting 140 MHz IF input to Receiver. Observe that CARRIER indicator goes out and check continuity of relay contacts (alarm condition). Reconnect IF inp-ut.

Table 3-11. Alarm Relay Contacts

	ALARM RELAY CONTACTS	
CONDITION	J5 (PINS 3 AND 1)	J5 (PINS 4 AND 11)
Normal	Open	Closed
Summary Alarm (Power, Data, or Carrier Fault)	Closed	Open

RECEIVED CARRIER LEVEL CHECK

Step 1. Vary the waveguide variable attenuator from maximum to minimum attenuation and observe that front panel AGC meter varies 0 to full scale.

Step 2. Increase the waveguide attenuation until the pattern generator displays a BER of approximately 1×10^{-6}. Change the pattern generator BER count to 10^{-8} in order to obtain a higher resolution measurement.

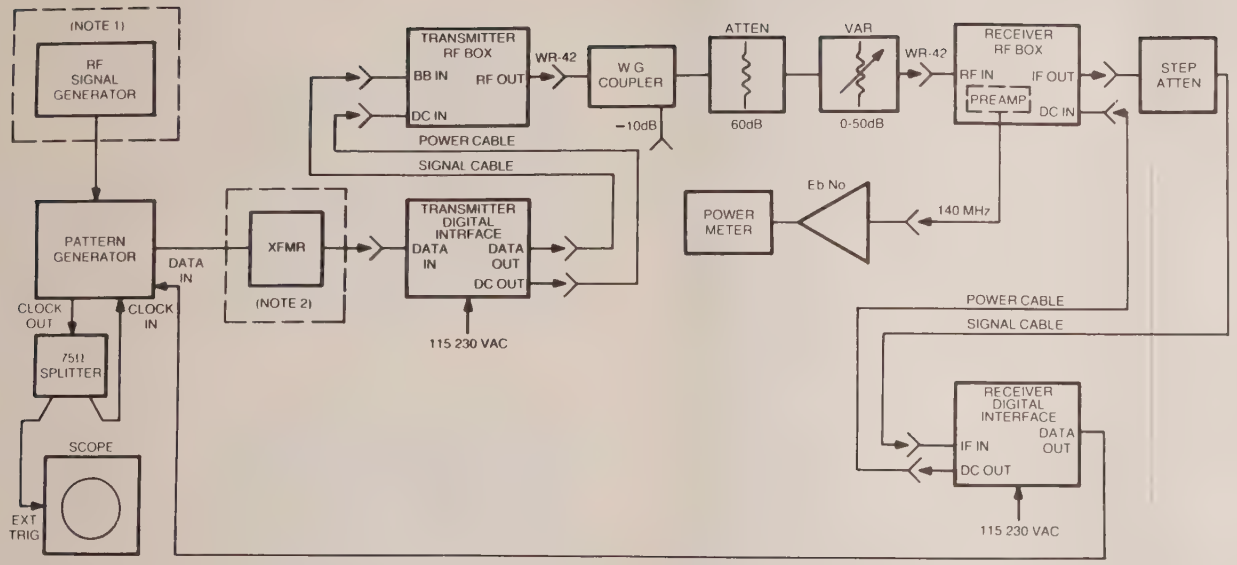


Figure 3-6. Receiver Digital Interface Test Configuration

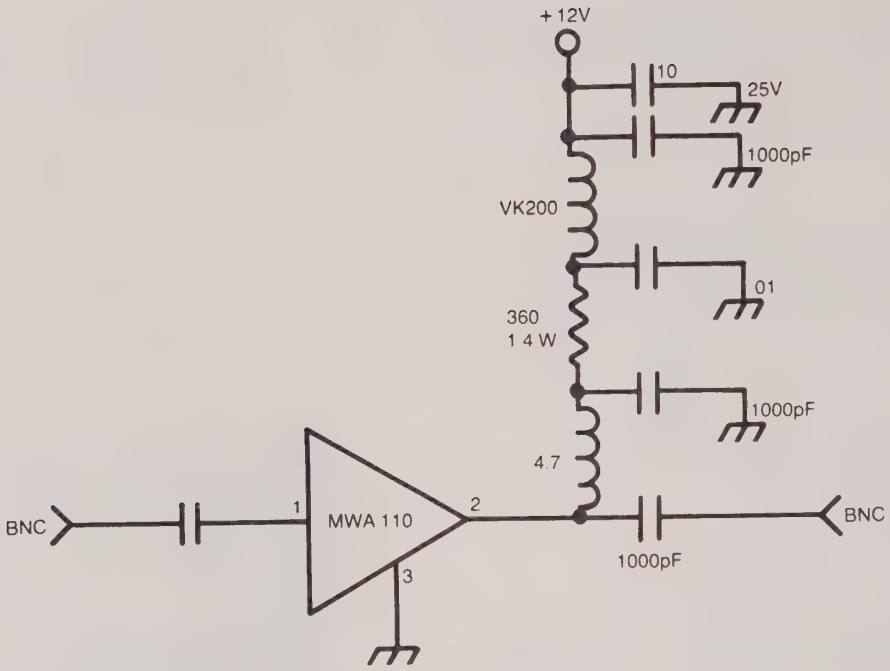


Figure 3-9. Eb/No Amplifier

SECTION 4
MAINTENANCE AND TROUBLESHOOTING

GENERAL

Maintenance of the MA-23DR Digital Radio System includes both preventive and corrective maintenance.

Preventive maintenance consists of the semi-annual and annual procedures adopted to prevent minor problems from developing into major breakdowns. Initiate and carry out a preventive maintenance schedule which checks system operation and exercises all control functions. This practice helps to avoid the occurrence of equipment malfunction and insures insures optimum system performance.

Corrective maintenance is indicated when a fault or impairment to normal operation is noted. Troubleshooting procedures will isolate the fault to a subsystem or unit. Repair, replacement or adjustment of the subsystem or unit will correct the fault to restore normal operation.

MAINTENANCE LOG. Record measurements and corrective action taken in a maintenance log as reference information for use in future alignment, maintenance and troubleshooting.

NOTE

Also, a log entry must be made any time the Transmitter is removed from service, or restored to service.

PREVENTIVE MAINTENANCE

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent occurrence of trouble, to reduce downtime, and to maintain the equipment in serviceable condition. Preventive maintenance procedures are normally performed semi-annually and annually; specific procedures are provided herein. The semi-annual checks should also be performed when the equipment is initially installed and when the equipment is reinstalled after removal for any reason.

PERIODIC MAINTENANCE. On a semi-annual basis, station personnel should record, in a maintenance log, the normal measurements of equipment operating parameters so that equipment performance overtime may be monitored. A comparison of the measurements entered in the maintenance log is a means of determining any long-period changes in equipment performance. M/A-COM does not recommend periodic adjustment of the equipment without cause. If operating policy requires operational checks be made on a periodic basis, these checks should be limited to those which do not unnecessarily alter equipment adjustments. Adjustments, as delineated in Section 3 of this manual, should be made only in the event that the equipment fails to met performance specifications. The periodic maintenance log should be examined to determine whether any failure that occurs is gradual or catastrophic. If the failure is of an abrupt nature, refer to the troubleshooting procedures before readjusting the equipment.

SEMI-ANNUAL CHECKS. If the equipment is in continuous use, perform only those steps that do not interfere with the equipment operation.

1. EXTERIOR SURFACES. Clean outside of case and front panel.

2. CABLE CONNECTIONS. Check all cable connections and finger-tighten if necessary.

3. MEASUREMENTS. Perform system operating parameters and record the readings in the maintenance log. Any variance from previous readings should be investigated.

ANNUAL CHECKS. Perform the following checks on an annual basis. If the equipment is in continuous use, perform only those steps that do not interfere with equipment operation.

1. HARDWARE. Tighten loose screws and replace missing hardware as required.

2. INDICATOR LAMPS. Check indicator lamp operation and replace if defective.

3. CABLES. Inspect for wear and fraying, and repair if necessary. Replace cable assemblies in which wiring insulation or connectors are damaged.

4. PAINTED SURFACES. Clean, and if necessary, paint bare metal spots, blistered, pitted or flaking areas.

5. ANTENNAS AND TOWERS. Check mounting hardware. Tighten or replace as necessary.

CORRECTIVE MAINTENANCE

Effective corrective maintenance can best be accomplished when the operating principles of both the overall system and the individual units comprising the system are fully understood. Therefore, the technical descriptions provided should be read thoroughly before attempting any corrective maintenance.

NOTE

Troubleshooting of this system should be undertaken only by experienced personnel, technically qualified personnel equipped with proper test equipment.

TROUBLESHOOTING PROCEDURES

Troubleshooting of the MA-23DR Digital Radio System is performed using the front panel indicators of the indoor, rack-mounted units. The functions of these indicators are fully described in the MA-23DR Operator's Manual.

Transmitter and Receiver troubleshooting diagnostics are provided in Tables 4-1 and 4-2, respectively. The troubleshooting tables direct the maintainer to the applicable Trouble Analysis Flow Diagram whenever an equipment malfunction occurs. The Trouble Analysis Flow Diagrams contained in Figures 4-1 through 4-5 are intended as a guide to isolate the problem to a particular unit.

HOT STANDBY TROUBLESHOOTING. In addition to status indicators on the Transmitter and Receiver Digital Interface Units described above, status indicators are provided on the front panel of the Hot Standby Switch over Unit. Hot Standby Switchover troubleshooting diagnostics are provided in Table 4-3.

RECOMMENDED SPARES. A recommended spares list is provided at the end of this section of the manual. Whenever spare units are available, M/A-COM recommends substitution of defective units with spares. Transmitter or Receiver Digital Baseband Units are not frequency sensitive, however, they must be configured for the specified digital data rate (T1, T1C, T2, CEPT1, or CEPT2) and interconnection cable length. On the other hand, Transmitter or Receiver RF Units are compatible with any digital data rate or cable length, but, they are frequency sensitive. Substitute RF Units must be set to operate at the same RF frequency as the units they are replacing.

The Transmitter Digital Interface Unit is configured for the specified digital data rate and interconnection cable length by using the appropriate Transmitter Baseband (main) Board and Cable Equalizer (or Cable Simulator) plug-in board. Refer to Recommended Spares List at the end of this section of the manual.

The Receiver Digital Interface Unit is configured for the specified digital data rate by using the appropriate Receiver Baseband (main) Board, 40 MHz IF Filter plug-in module, and Cable Equalizer (or Cable Simulator) plug-in board. Refer to Recommended Spares List for details).

The Transmitter and Receiver RF Units are factory set for the specified operating frequencies.

CAUTION

Static sensitive devices are used extensively in MA-23DR Radio Equipments. Be sure to observe standard precautions when handling or repairing modules containing static sensitive devices.

Table 4-1. Transmitter Troubleshooting

FAULT CONDITION	LED INDICATORS			METER (GUNN CURRENT)	ALARM RELAY CONTACTS		TROUBLE ANALYSIS FLOW DIAGRAMS
	POWER	GUNN	DATA		J7-3 TO J7-11	J7-4 TO J7-11	
None (Normal Operation)	ON	ON	ON	2 to 5	CLOSED	OPEN	–
POWER FAULT	OFF	OFF	OFF	Zero	OPEN	CLOSED	Figure 4-1
GUNN FAULT	ON	OFF	ON	2 or 5	OPEN	CLOSED	Figure 4-2
DATA FAULT	ON	ON	OFF	2 to 5	OPEN	CLOSED	Figure 4-3

Table 4-2. Receiver Troubleshooting

FAULT CONDITION	LED INDICATORS			METER (AGC VOLTS)	ALARM RELAY CONTACTS		TROUBLE ANALYSIS FLOW DIAGRAMS
	POWER	CARRIER	DATA		J5-3 TO J5-11	J5-4 TO J5-11	
None (Normal Operation)	ON	ON	ON	Meter Upscale	CLOSED	OPEN	–
POWER FAULT	OFF	OFF	OFF	Zero	OPEN	CLOSED	Figure 4-1
CARRIER FAULT	ON	OFF	OFF	Meter = 0 or Downscale	OPEN	CLOSED	Figure 4-4
DATA FAULT	ON	ON	OFF	Meter Upscale	OPEN	CLOSED	Figure 4-5

Table 4-3. Hot Standby Troubleshooting

FAULT INDICATION	RECOMMENDED ACTION
TX ALARM 1 or 2 lights.	Examine state of status indicators on corresponding TX Digital Interface Unit to determine nature of fault. Refer to Table 4-1 for appropriate Trouble Analysis Flow Diagram.
RX ALARM 1 or 2 lights.	Examine state of status indictors on corresponding RX Digital Interface Unit to determine nature of fault. Refer to Table 4-2 for appropriate Trouble Analysis Flow Diagram.
WG SW ALARM lights.	If the RF Unit is accessible, open the door and operate the waveguide switch manually until the unit can be repaired or replaced. NOTE: After receiving a control logic command, there is a short delay before the waveguide swtich carries out its switching function. During this period, the indicator will light briefly. This is normal.

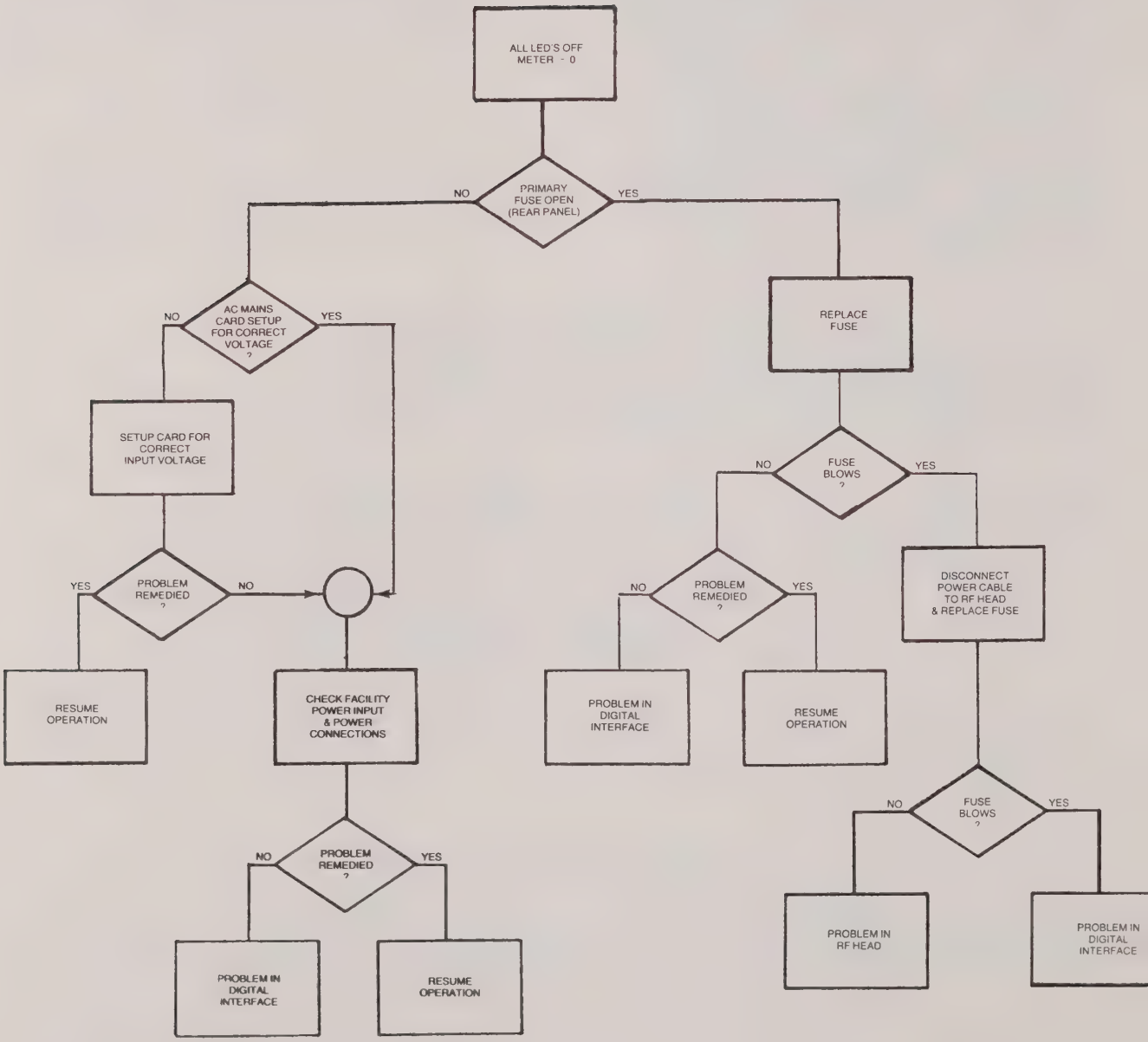


Figure 4-1. Trouble Analysis Flow Diagram – Chart A

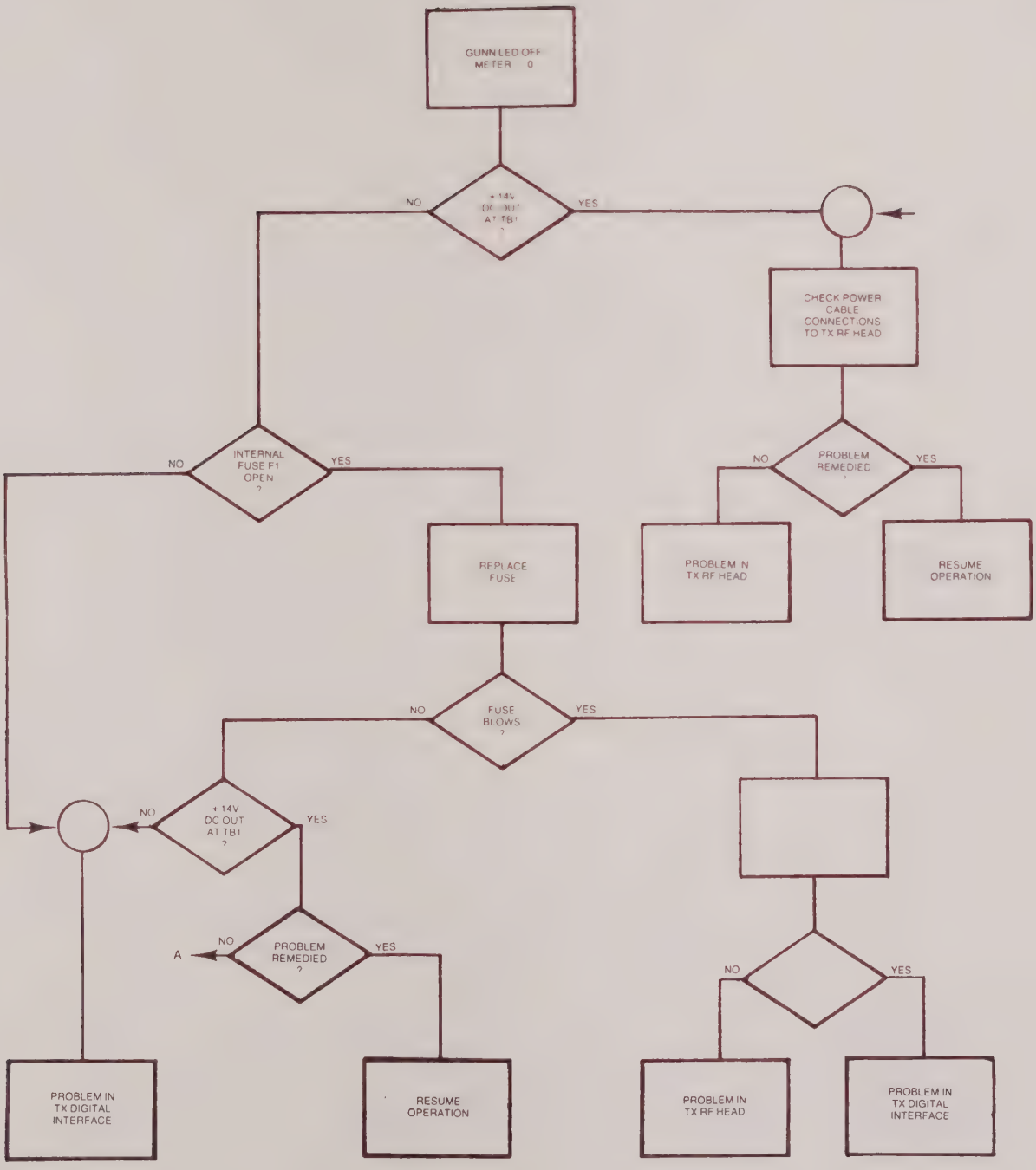


Figure 4-2. Trouble Analysis Flow Diagram – Chart B

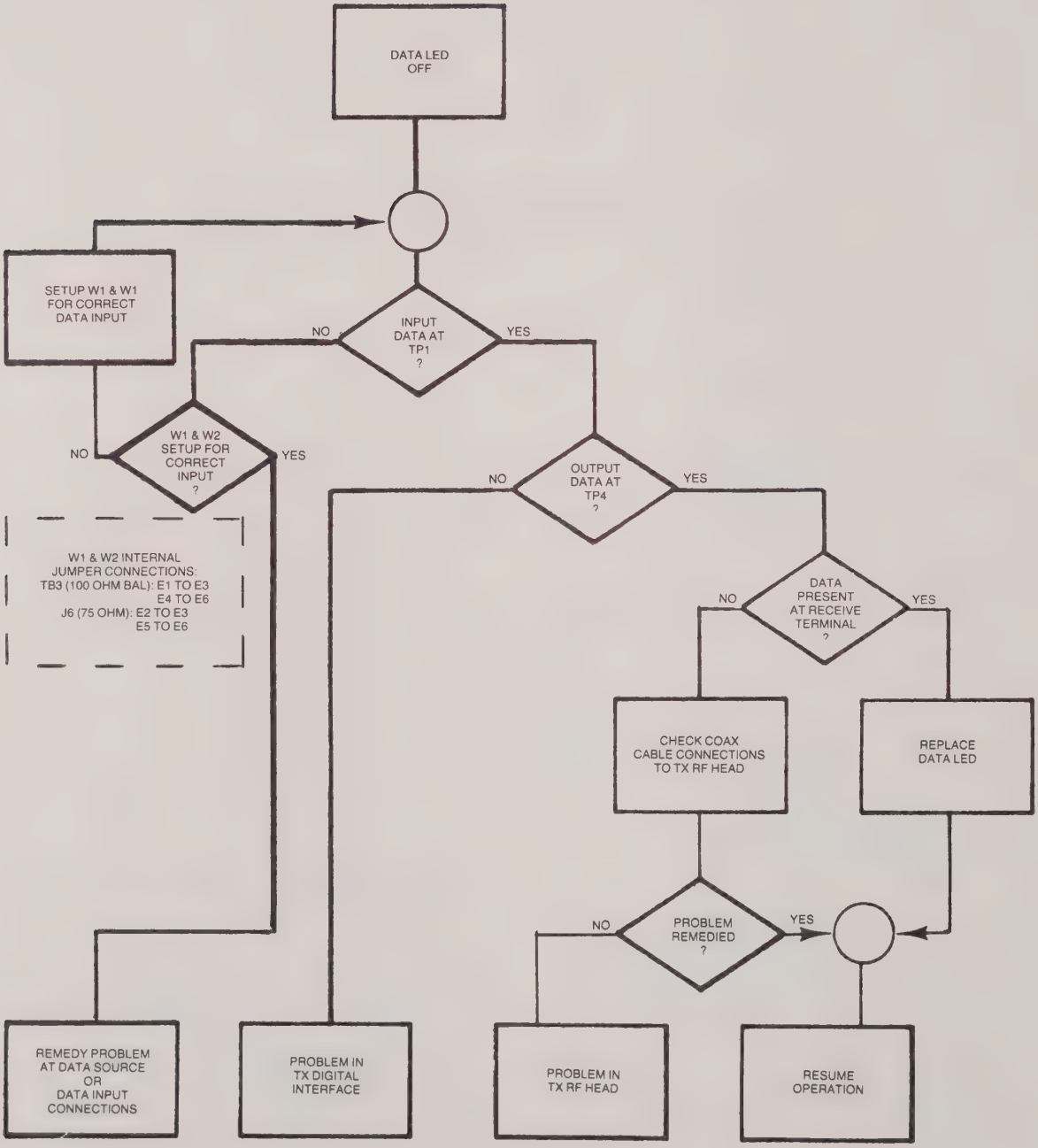


Figure 4-3. Trouble Analysis Flow Diagram – Chart C

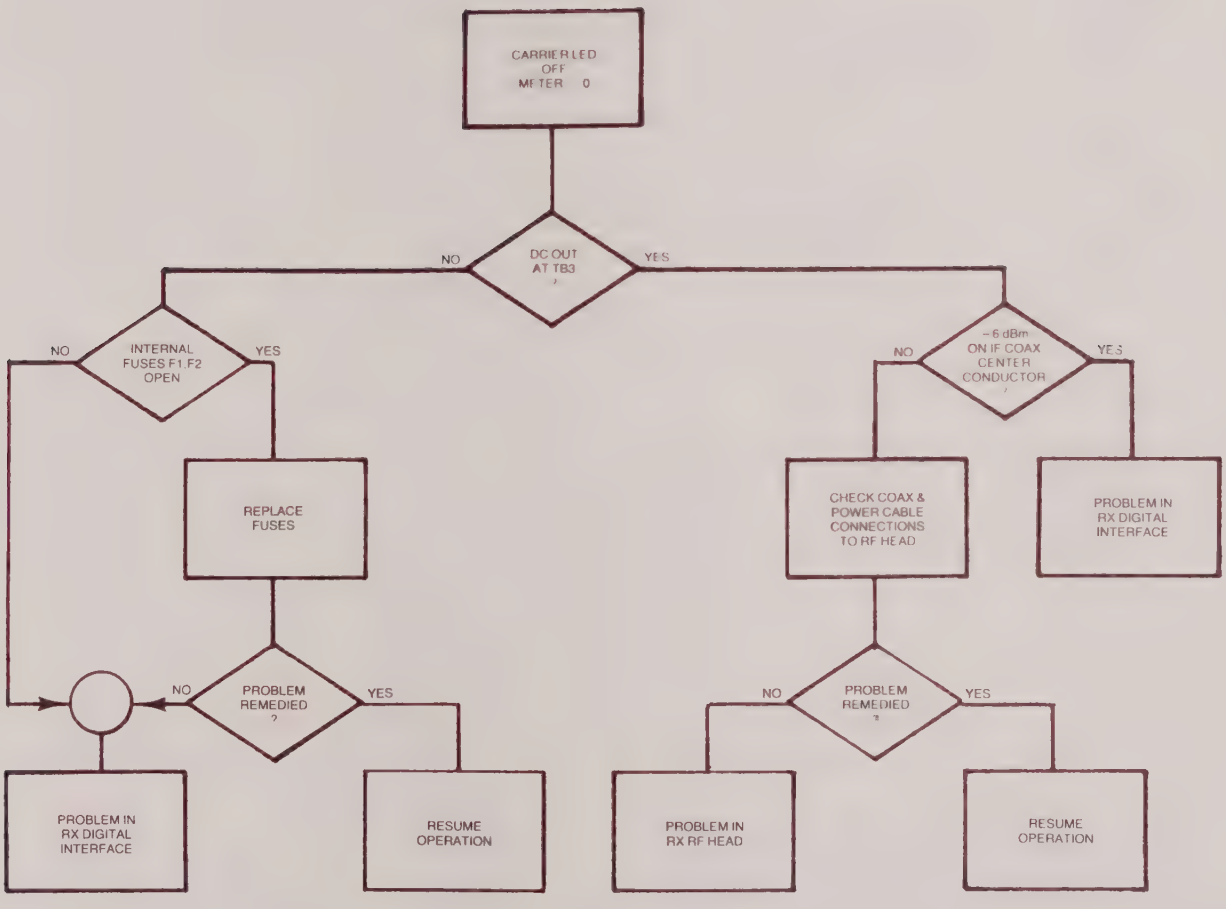


Figure 4-4. Trouble Analysis Flow Diagram – Chart D

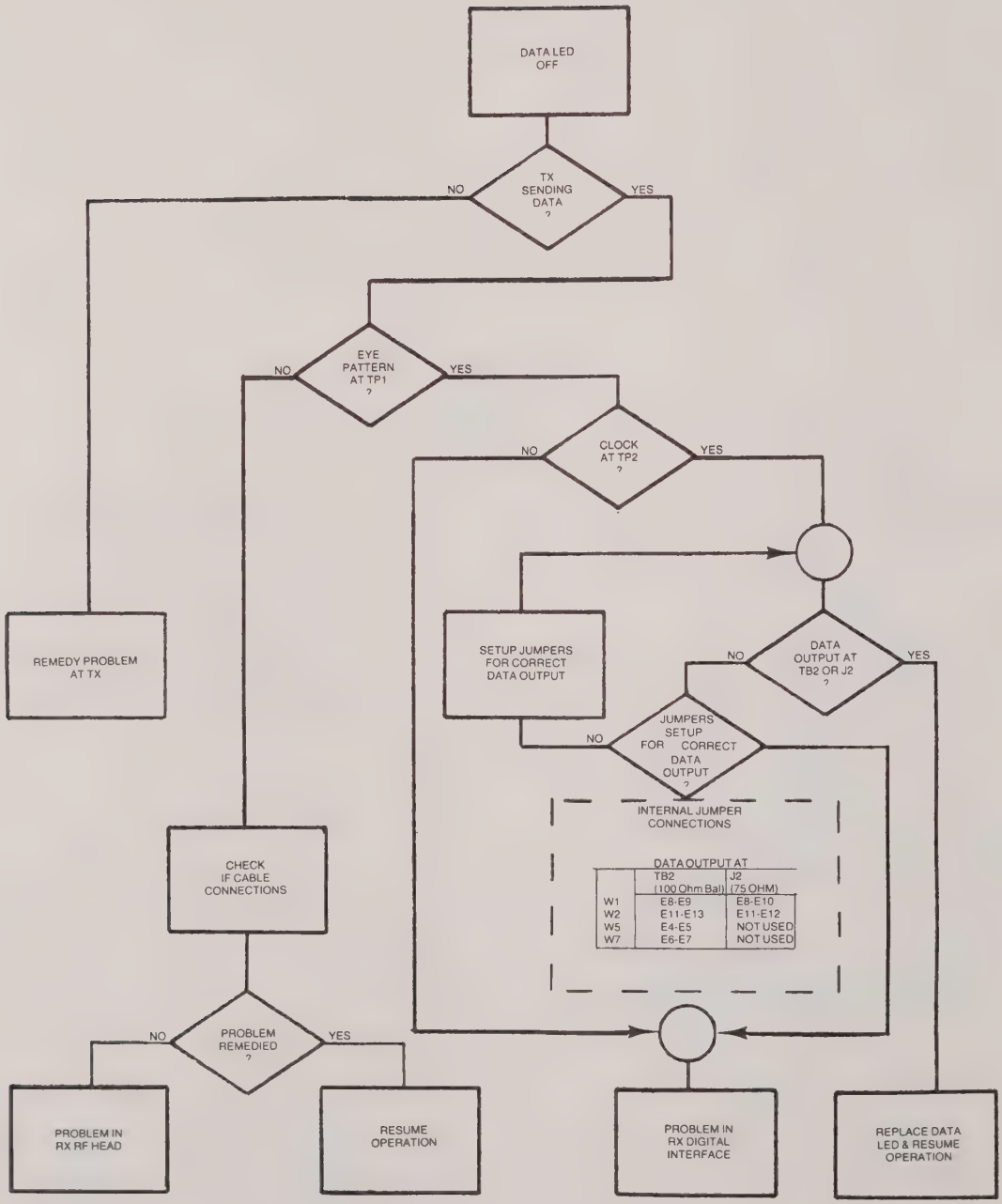


Figure 4-5. Trouble Analysis Flow Diagram – Chart E

STANDARD MA-23DR SPARE PARTS

Spare parts for MA-23DR and MA-23DR12T systems are offered in subsystem modules and also in circuit board/component kits. M/A-COM recommends field stocking of subsystem modules for any application where downtime sufficient to allow factory shipment of replacement subsystems or components cannot be tolerated. M/A-COM recommends field stocking of circuit board/component kits only by factory trained personnel or dealers.

MA-23DR SUBSYSTEM MODULES (UNPROTECTED)

BASEBAND UNITS(Specify ac or dc, distance from cross connect. For dc power, change -xAC to -xDC.	
Transmitter Controller–AC Power	
T1	1841558-1AC
CEPT1	1841558-2AC
T1C	1841558-3AC
T2	1841558-4AC
CEPT2	1841558-5AC
Receiver Controller–AC Power	
T1	1841560-1AC
CEPT1	1841560-2AC
T1C	1841560-3AC
T2	1841560-4AC
CEPT2	1841560-5AC
DUPLEX RF UNITS (Specify frequency channels)	
Duplex TX/RX RF Units	1841478-1
ANTENNAS	
2 Foot Parabola and Mount	1841480-1
4 Foot Parabola and Mount	842244-1
6 Foot Parabola and Mount	843820-1

MA-23DR SUBSYSTEM MODULES (PROTECTED HOT STANDBY)

BASEBAND UNITS (Specify ac or dc, distance from cross connect. For dc power, change -xAC to -xDC.	
Transmitter Controller–AC Power	
T1	1841558-1AC
CEPT1	1841558-2AC
T1C	1841558-3AC
T2	1841558-4AC
CEPT2	1841558-5AC
Receiver Controller–AC Power	
T1	1841560-1AC
CEPT1	1841560-2AC
T1C	1841560-3AC
T2	1841560-4AC
CEPT2	1841560-5AC
HOT STANDBY RF UNITS (Specify frequency channels)	
Complete Assembled TX/RX	842900
TX Only w/Waveguide	842901
RX Only	8942902
HOT STANDBY SWITCHING SHELF	
AC	842340-1
DC	842340-2
ANTENNAS	
2 Foot Parabola and Mount	1841480-1
4 Foot Parabola and Mount	842244-1
6 Foot Parabola and Mount	843820-1

MA-23DR CIRCUIT BOARD/COMPONENTS SPARES KIT (UNPROTECTED)

Complete Kit – Unprotected	
AC	1842552[1,2,3]
DC	1842552[1,2,3]
Includes: 2 Each TX Oscillator	1840242-99[1]
1 Each TX Voltage Regulator	1841788-2
1 Each TX/RX RFI Board	1841720-1
1 Each TX Baseband Power Supply	
AC	1841570-2
DC	843490-2
1 Each TX Baseband Board	1841556-x[2]
2 Each RX LO/Mixer/Preamp	8428701
1 Each RX Voltage Regulator	1841788-1
1 Each RX 140 MHz IF Board	1843901-1
1 Each RX Baseband Power Supply	
AC	1841570-1
DC	843490-1
1 Each RX Baseband Board	1841562-x[2]
1 Each RX 40 MHz Filter	1841578-x[2]
1 Each TX Cable Equalizer/Simulator Board (Select one)	
23DR Radios shipped	
Prior to 2/1/85	1841568
All other 23DR Radios	1841973-A[3]
1 Each RX Cable Equalizer/Simulator Board (Select one)	
23DR Radios shipped	
Prior to 2/1/85	1841568
23DR T2 Radios shipped	
After 2/1/85	1842711-B[3]
All other 23DR Radios	1841973-B[3]

MA-23DR CIRCUIT BOARD COMPONENTS SPARES KIT (PROTECTED HOT-STANDBY)

In addition to complete kit (unprotected) above, please order the following:

Hot Standby Display Card (Switches & LED)	843330-1
Hot Standby Logic Control Card	843334-1
Hot Standby Power Supply (AC)[4]	842640-1[4]
Waveguide Switch	842909-1
TX RFI Filter Board[5]	
AC	843806-1[5]
DC	843806-2[5]
TX Switch Driver Board	
AC	842908-1
DC	842907-1

NOTES TO SPARE PARTS LISTS (MA-23DR & MA-23DR12T)

[1]Specify RF frequency channel for frequency sensitive items.

[2]Specify data rate for TX and RX Baseband Boards and Filters. If ordering single parts, specify "x" as follows: T1 [-1), CEPT1 (-2), T1C (-3), T2 (-4), or CEPT2 (-5).

[3]Specify amount of equalization needed. Value is determined by data rate and distance of cross-connect to Baseband Controller. Use the following charts to determine "A" and "B."

[4]Hot Standby DC Power Supply is same as RX Baseband DC Power Supply (PN 843490-1) in unprotected kit.

[5]RX RFI Filter Board is same as TX/RX RFI Filter Board PN 1841720-1) in unprotected kit.

"A"

	Feet	T1	CEPT1	T1C	T2	CEPT2
Distance	0	−0	−0	−0	−4	−0
Source or	250	−1	−1	−1	−5	−1
Cross-Connect	500	−2	−2	−2	−6	−2
To Baseband	750	−3	−3	−3	−7	−3
Controller (Ft)	1000	−4	−4	−4	−8	−4

"B"

	Feet	T1	CEPT1	T1C	T2	CEPT2
Distance	0	−0	−0	−0	−4	−0
Source or	250	−1	−0	−1	−3	−0
Cross-Connect	500	−2	−0	−2	−2	0
To Baseband	750	−3	−0	−3	−1	−0
Controller (Ft)	1000	−4	−0	−4	−0	−0

SECTION 5
DIAGRAMS

Figure 5-1. MA-23DR Transmitter Assembly PN 1841558F 5-3
Figure 5-2. Transmitter Baseband Board – Component Locations PN 1841556S 5-5
Figure 5-3. Transmitter Baseband Board – Schematic Diagram PN 1841556S (Sheet 1 of 2) 5-7
Figure 5-3. Transmitter Baseband Board – Schematic Diagram PN 1841556S (Sheet 2 of 2) 5-9
Figure 5-4. Line Equalizer – Component Locations Schematic Diagram PN 1841568A 5-11
Figure 5-5. Cable Simulator – Component Locations Schematic Diagram PN 842711A 5-12
Figure 5-6. Cable Simulator – Component Locations/ Schematic Diagram PN 841973A 5-13
Figure 5-7. Meter Assembly PN 1841749A 5-14
Figure 5-8. Power Supply – Component Locations PN 1841570D 5-15
Figure 5-9. Power Supply – Schematic Diagram PN 1841570D 5-17
Figure 5-10. Power Supply – Component Locations PN 1841554C 5-19
Figure 5-11. DC/DC Converter – Component Locations PN 843490B 5-21
Figure 5-12. DC/DC Converter – Schematic Diagram PN 843490B 5-23
Figure 5-13. DC/DC Converter – Component Locations PN 843512-1B 5-25
Figure 5-14. DC/DC Converter – Schematic Diagram PN 843512-1B 5-27
Figure 5-15. MA-23CC Receiver Assembly PN 1841560G 5-29
Figure 5-16. Receiver Baseband Board – Component Locations PN 1841562S 5-32
Figure 5-17. Receiver Baseband Board – Schematic Diagram PN 1841562S (Sheet 1 of 2) 5-33
Figure 5-17. Receiver Baseband Board – Schematic Diagram PN 1841562S (Sheet 2 of 2) 5-35
Figure 5-18. 40 MHz IF Filter Board – Component Locations/Schematic Diagram PN 1841578E 5-37
Figure 5-19. MA-23DR RF Box Assembly PN 1841478H 5-39
Figure 5-20. Regulator Board – Component Locations/ Schematic Diagram PN 1841788K 5-41
Figure 5-21. RFI Filter – Component Locations/ Schematic Diagram PN 1841720E 5-43
Figure 5-22. Receiver Mixer Oscillator Preamplifier Assembly PN 1842870C 5-45
Figure 5-23. 140 MHz IF Amplifier – Component Locations PN 1843901-1A 5-48
Figure 5-24. 140 MHz IF Amplifier – Schematic Diagram PN 1843901-1A 5-49
Figure 5-25. 140 MHz Preamplifier – Component Locations Schematic Diagram PN 1841936-1G 5-51
Figure 5-26. 24 GHz Mixer/Oscillator Assembly PN 842871C 5-53
Figure 5-27. Temperature Control Board – Component Locations Schematic Diagram PN 842744-1B 5-54
Figure 5-28. Hot Standby Switch Assembly PN 842340C (Sheet 1 of 2) 5-55
Figure 5-28. Hot Standby Swtich Assembly PN 842340C (Sheet 2 of 2) 5-57
Figure 5-29. Display Board – Component Locations PN 843330-1B 5-60
Figure 5-30. Display Board – Schematic Diagram PN 843330-1B 5-61
Figure 5-31. Control Logic – Component Locations PN 843334-1A 5-63
Figure 5-32. Control Logic – Schematic Diagram PN 843334-1A 5-65
Figure 5-33. Backplane – Component Locations PN 843332-1A 5-68
Figure 5-34. Backplane – Schematic Diagram PN 843332-1A 5-69
Figure 5-35. AC Power Supply – Component Locations PN 842640-1C 5-72
Figure 5-36. AC Power Supply – Schematic Diagram PN 842640-1C 5-73
Figure 5-37. AC Power Supply – Component Locations PN 842642-1A 5-75
Figure 5-38. Hot Standby Duplex RF Assembly PN 842900A 5-76
Figure 5-39. Transmitter Hot Standby RF Assembly PN 842901-1 5-77
Figure 5-40. Transmitter Source PN 1840242J 5-79
Figure 5-41. Input RFI Filter – Schematic Diagram PN 843411-1 5-80
Figure 5-42. RFI Board – Component Locations Schematic Diagram PN 843806 5-81
Figure 5-43. Receiver Hot Standby RF Assembly PN 842902-1 5-83
Figure 5-44. 140 MHz IF Amplifier – Component Locations Schematic Diagram PN 1841930-1E 5-85

LIST OF ILLUSTRATIONS (CONT)

Figure 5-45. Negative Switch Driver – Component Locations/Schematic Diagram PN 842907A 5-87
Figure 5-46. Power Supply Interconnect Assembly PN 1841574 5-89
Figure 5-47. DC/DC Converter – Wiring Harness PN 843755A 5-89
Figure 5-48. RF Box – Wiring Harness PN 1841847-1B 5-89
Figure 5-49. Mixer/Oscillator – Wiring Harness PN 842869-1B 5-90
Figure 5-50. LED – Wiring Harness PN 843333-1A 5-90
Figure 5-51. DC Power Supply – Wiring Harness PN 843807-1A 5-90
Figure 5-52. TX Power – Wiring Harness PN 843436-1A 5-91
Figure 5-53. TX Data and Alarm – Wiring Harness PN 843442-1A 5-91
Figure 5-54. RX1 and RX2 Interconnect – Wiring Harness PN 843431A 5-92
Figure 5-55. AC Power Supply – Wiring Harness PN 843510-1B 5-92
Figure 5-56. Transmitter Wiring Harness Assembly PN 1841847-1B 5-92
Figure 5-57. Hot Standby RF Head – Wiring Harness PN 842916-1 5-93
Figure 5-58. Waveguide Switch – Wiring Harness PN 842919-1B 5-93
Figure 5-59. IF Amplifier – Wiring Harness PN 1841879-1 5-93
Figure 5-60. Power Wiring Harness Assembly PN 1841722-1 5-94
Figure 5-61. Receiver Wiring Harness Assembly PN 1841850A 5-94
Figure 5-62. Hot Standby RF Head – Wiring Harness PN 843816B 5-94
Figure 5-63. Power Cable – Receiver Simplex PN 1841932B 5-95
Figure 5-64. Power Cable – Transmitter Simplex PN 1842030B 5-95
Figure 5-65. Power Cable Hot Standby PN 843343B . 5-96

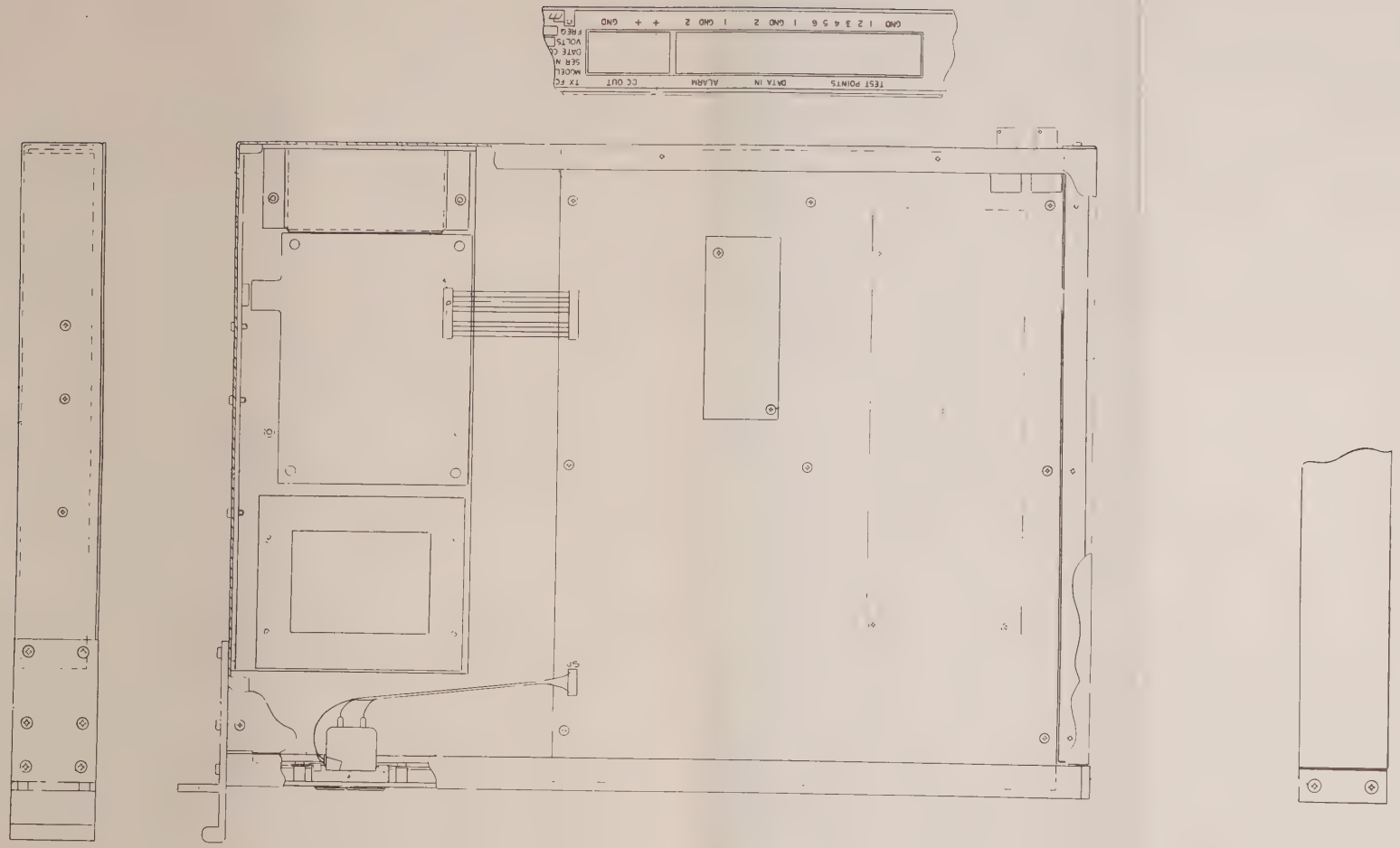


Figure 5-1. MA-23DR Transmitter Assembly
PN 1841558F

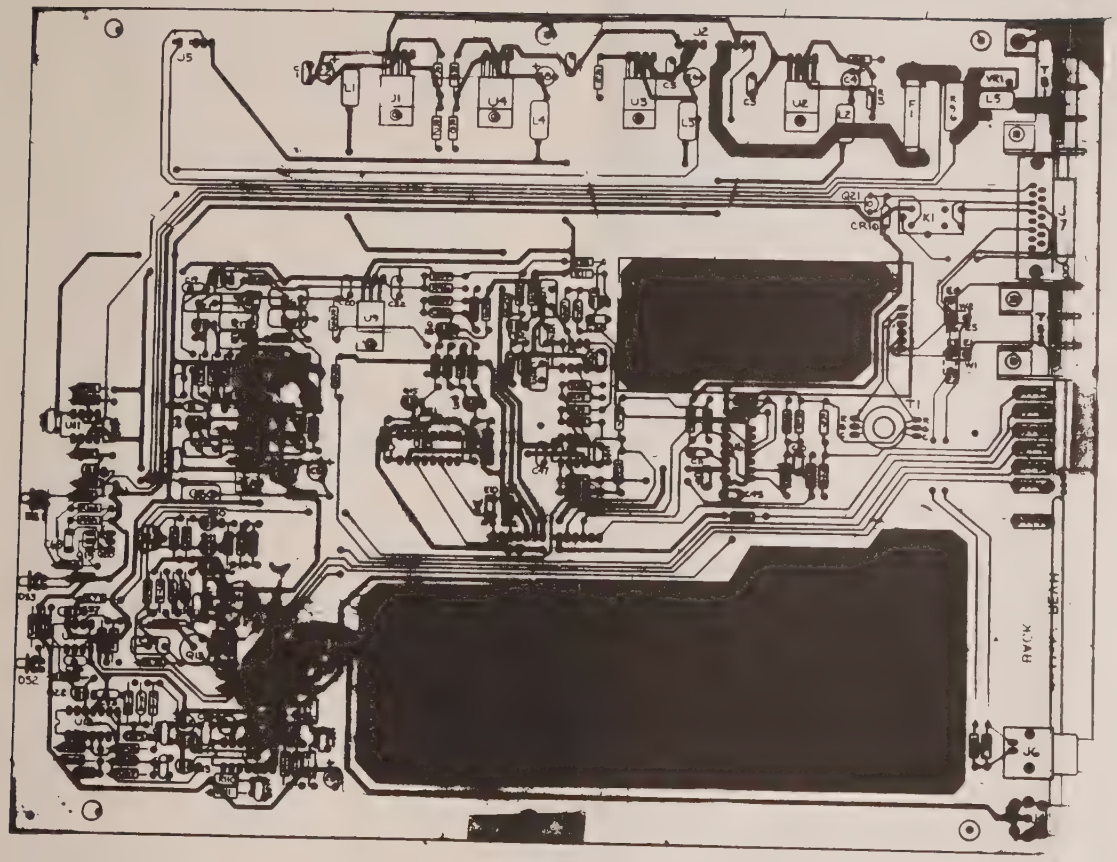
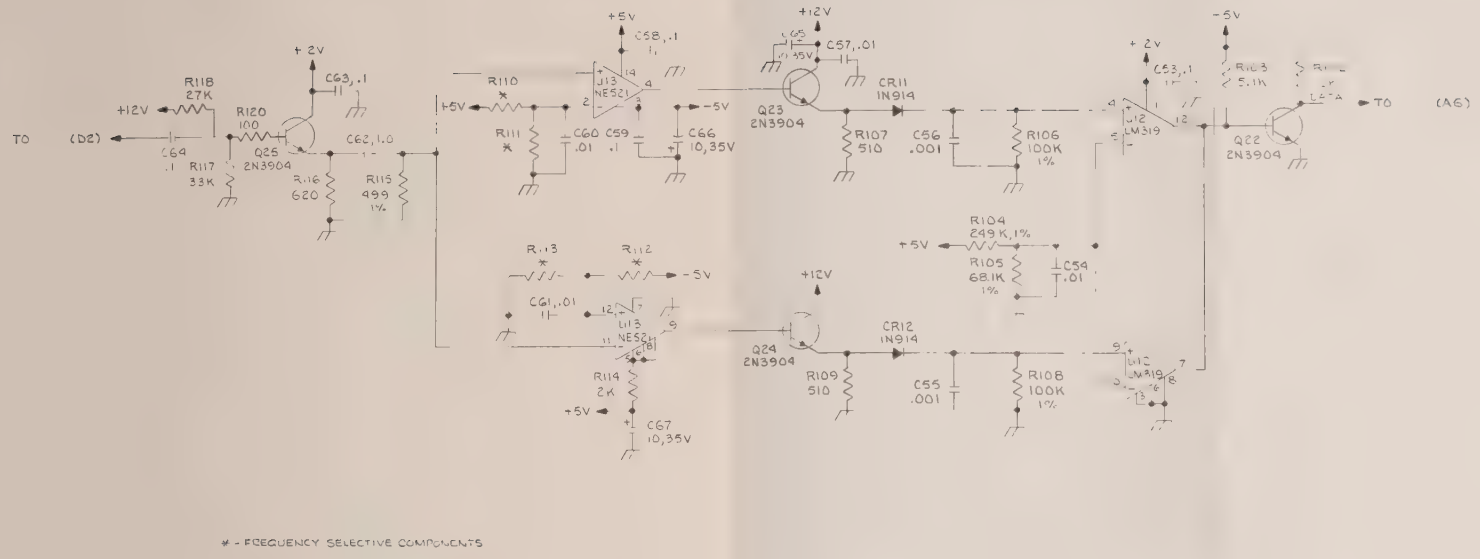


Figure 5-2. Transmitter Baseband Board – Component Locations PN 1841556S



* - FREQUENCY SELECTIVE COMPONENTS

Figure 5-3. Transmitter Baseband Board – Schematic Diagram PN 1841556S (Sheet 1 of 2)

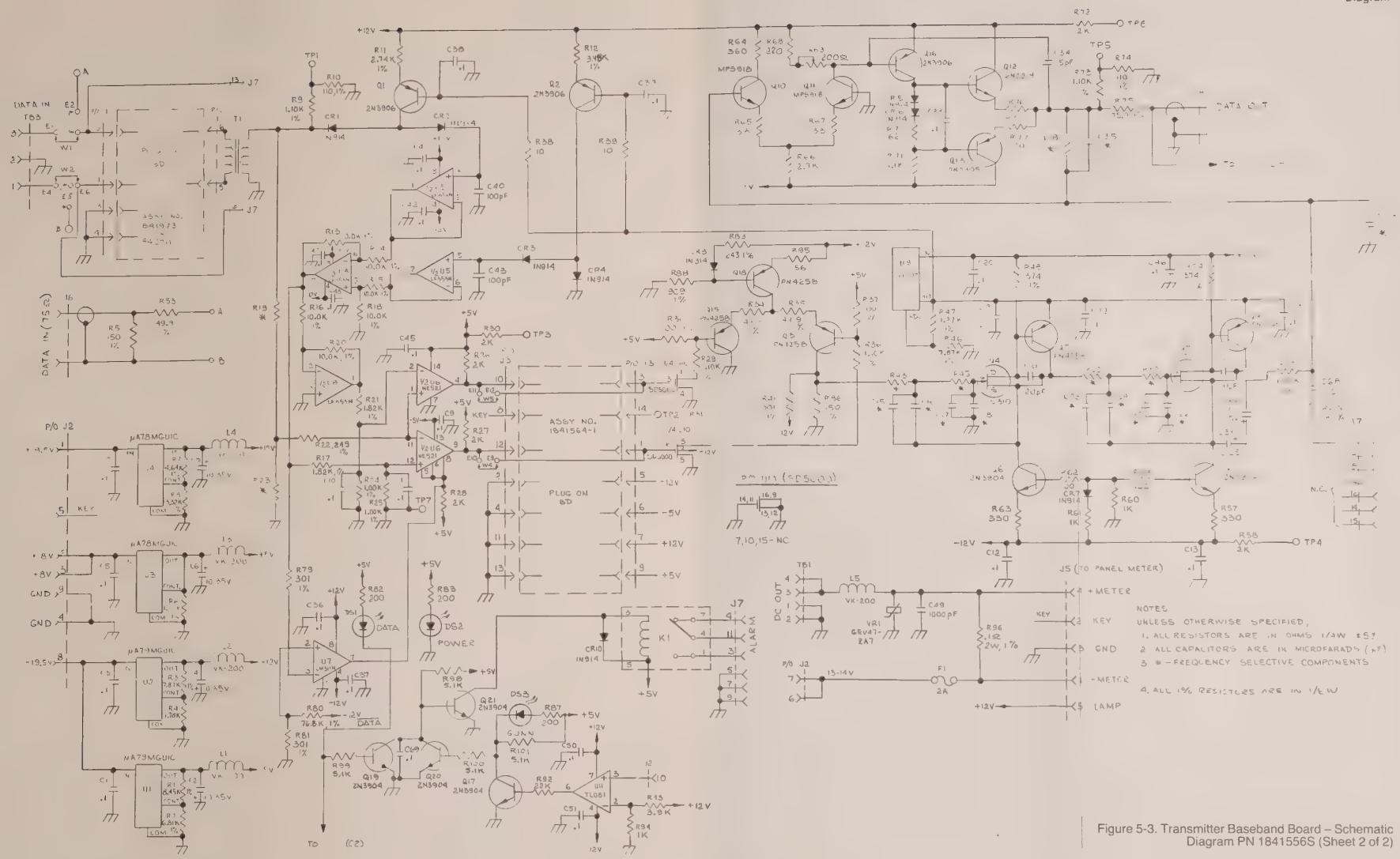


Figure 5-3. Transmitter Baseband Board – Schematic Diagram PN 1841556S (Sheet 2 of 2)

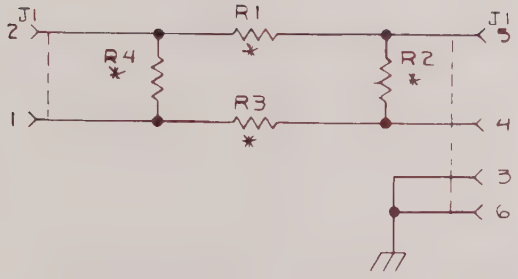
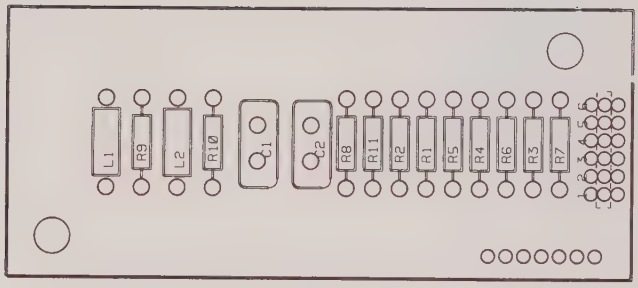


Figure 5-4. Line Equalizer – Component Locations/Schematic Diagram PN 1841568A



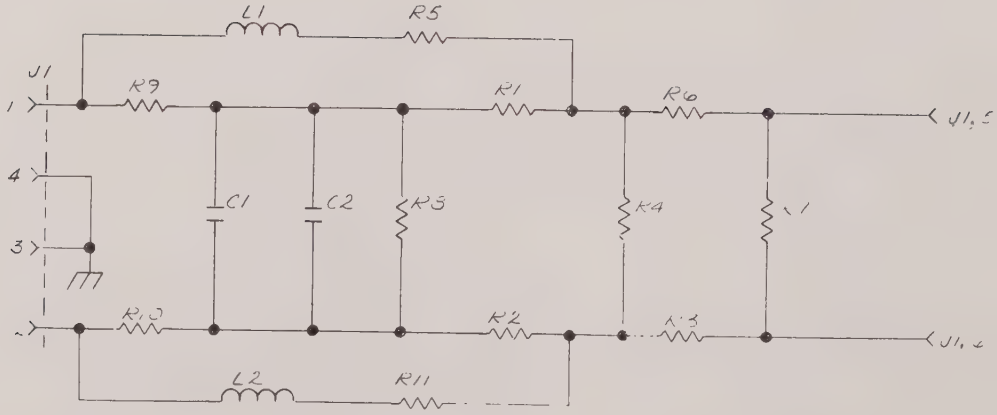
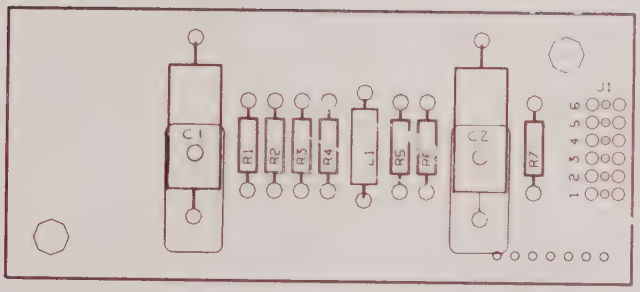


Figure 5-5. Cable Simulator – Component Locations/Schematic Diagram PN 842711A



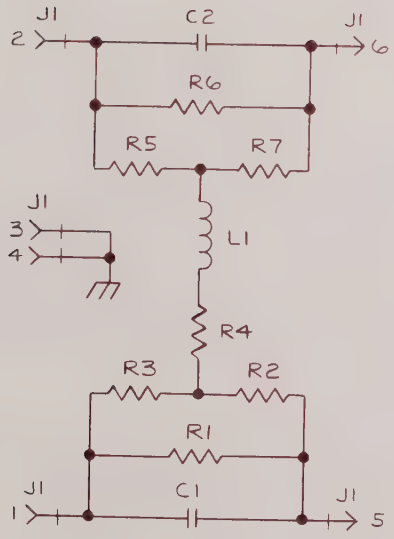
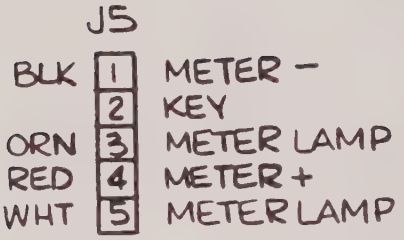


Figure 5-6. Cable Simulator – Component Locations/Schematic Diagram PN 841973A



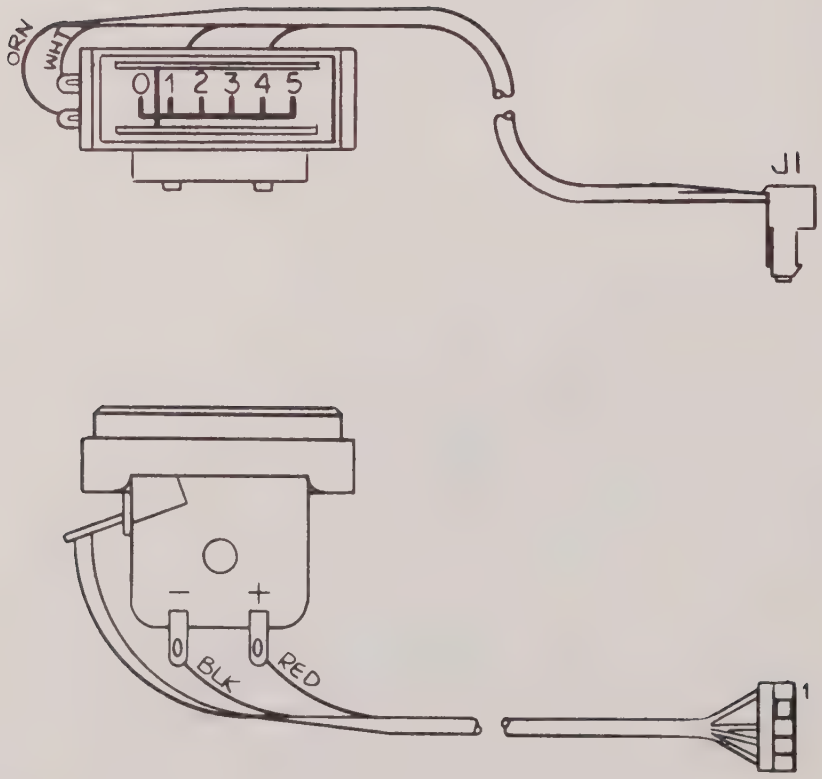
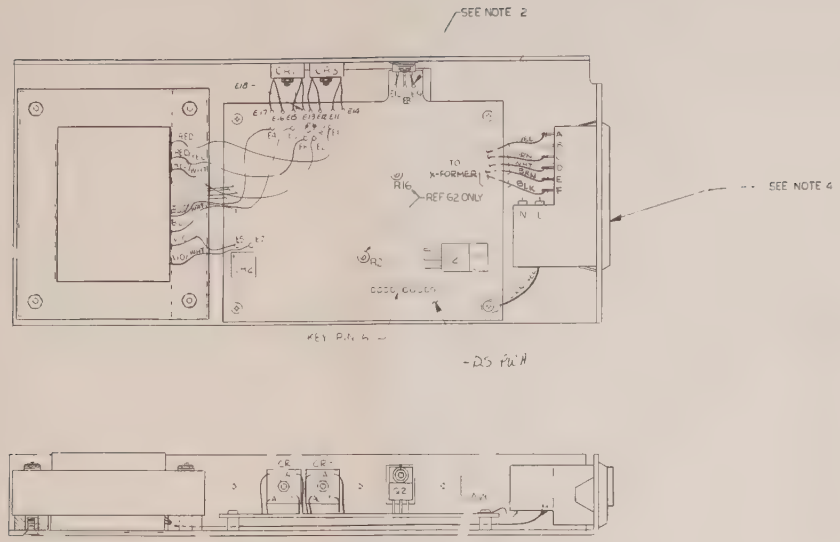


Figure 5-7. Meter Assembly PN 1841749A



J1 PIN FUNCTIONS			
GROUP 1		GROUP 2	
PIN #	NOT USED	PIN #	ALARM OUT 5.0 VDC
2	GND	2	GND
3	-16 V UNREG	3	-20 V UNREG
4	+20 V UNREG	4	+14 V REG
5	+20 V UNREG	5	+14 V REG
6	KEY	6	KEY
7	GND	7	GND
8	+10 V UNREG	8	+10.5 V UNREG
9	+10 V UNREG	9	+10.5 V UNREG
10	+20 V UNREG	10	+18 V UNREG

WIRING LIST

LINE	FROM	TO	COLOR	TEM NO	LINE	FROM	TO	COLOR	ITEM NO
1	XFMR 10V	PWA-E3	BLU	P/O ITEM 3	23	CR3 +	E14	NA	NA
2	0V	E4	BLU/WHT		24	CR3 AC	E13	NA	NA
3	16V	E6	VIO		25	CR3 AC	E11	NA	NA
4	0V	E7	VIO/WHT						
5	18V	E8	RED/YEL						
6	17V	E2	RED/WHT						
7	0V	PWA-E1	RED						
8	0V	FILTER F	BLK						
9	120V	FILTER D	WHT						
10	100V	FILTER A	YEL						
11	120V	FILTER C	ORN						
12	XFMR 0V	FILTER E	BRN	P/O ITEM 3					
13									
14									
15	FILTER B	FILTER L	BLK	17					
16	FILTER J	FILTER N	WHT	16					
17	FILTER GND	GND	GRN/YEL	18					
18	CR1 -	E16	NA	NA					
19	CR1 +	E18							
20	CR1 AC	E17							
21	CR1 AC	E15							
22	CR3 -	E12	NA	NA					

NOTES:

1.

2. FOR GROUP 1 WHEN Q2 IS NOT USED, JUMPER W1 WILL BE BETWEEN E8 & E10. ALSO W3 WILL BE BETWEEN E6 & E13. FOR GROUP 2 W1 & W3 ARE NOT USED. W2 SHOULD BE BETWEEN E2 & E13, ALL JUMPERS INSTALLED AT PWA.

3. TEST PER TP00694

4. FOR 220 OR 240 VAC OPERATION REPLACE FUSE 1.0A WITH FUSE 0.5A AND REMOVE AC INPUT SELECTION PWB (PART OF [illegible]), AND REINSERT CHOOSING 220 OR 240 VAC OPERATION.

5. ——————— INSTALL ITEM 20 ON BOTH SIDES OF ITEMS 24 & 25.

Figure 5-8. Power Supply – Component Locations
PN 1841570D

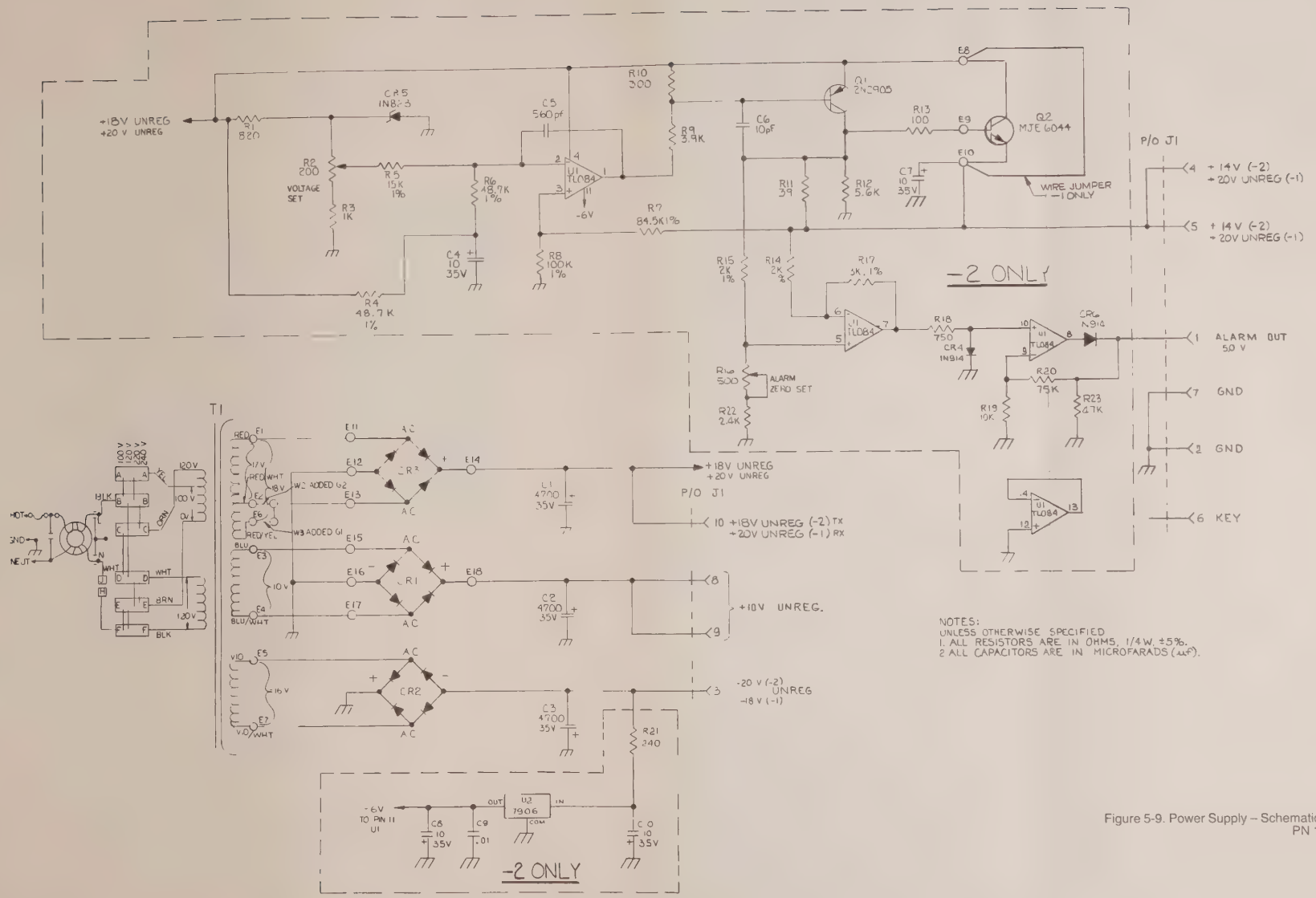


Figure 5-9. Power Supply – Schematic Diagram
PN 1841570D

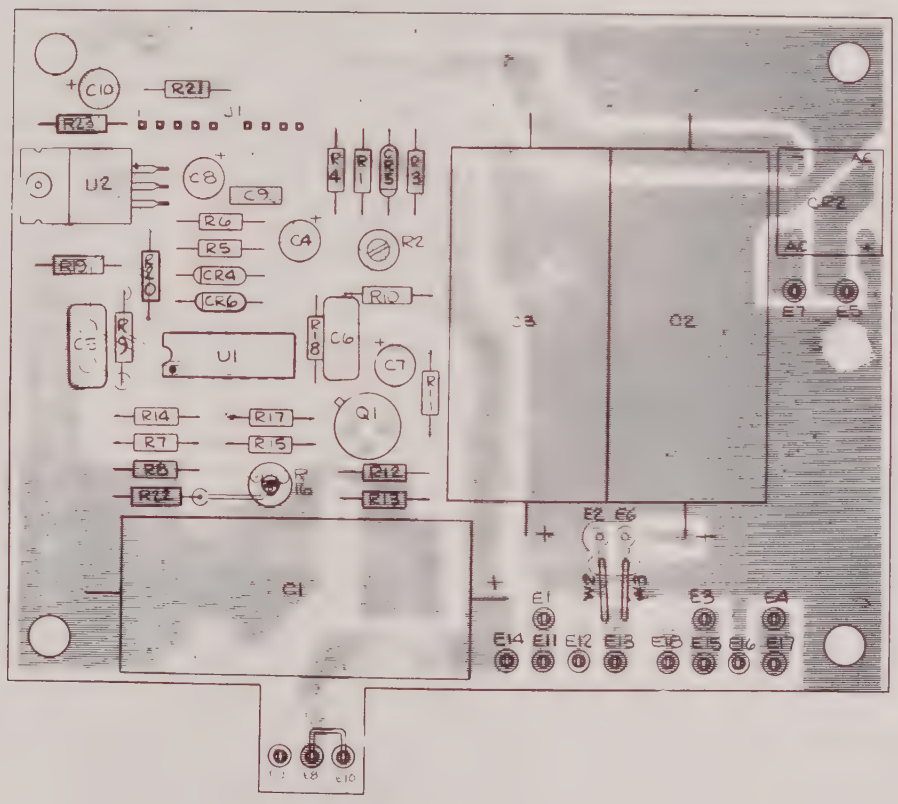


Figure 5-10. Power Supply – Component Locations PN 1841554C

(THIS PAGE LEFT INTENTIONALLY BLANK)

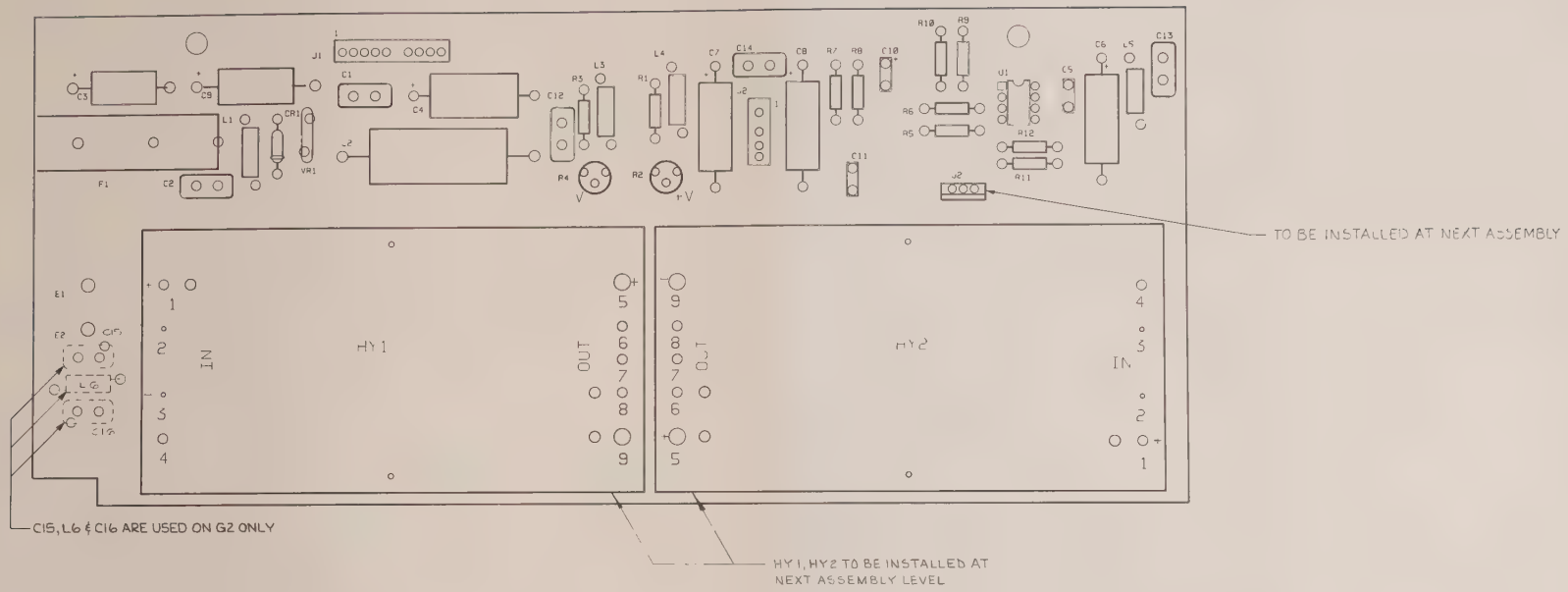
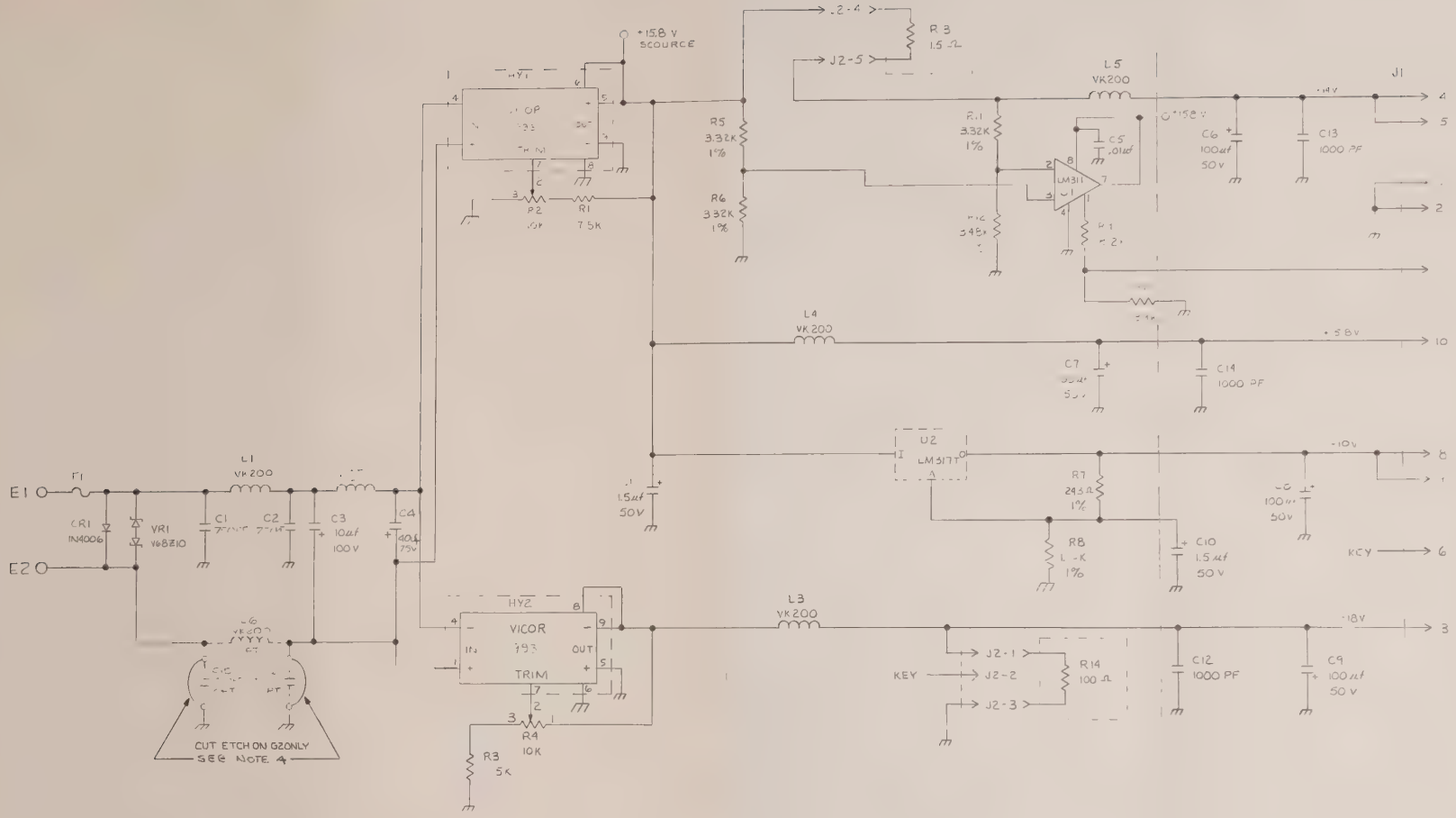


Figure 5-11. DC/DC Converter – Component Locations PN 843490B



NOTES:
UNLESS OTHERWISE SPECIFIED:
1. RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%
2. CAPACITOR VALUES ARE IN MICROFARADS
3. COMPONENTS WITHIN DASHED LINES ARE INSTALLED AT NEXT LEVEL.
4. C15, L6 & C16 ARE USED ON G2 ONLY. CUT TRACE ON PCB AS SHOWN WHEN THESE COMPS ARE INSTALLED

Figure 5-12. DC/DC Converter – Schematic Diagram
PN 843490B

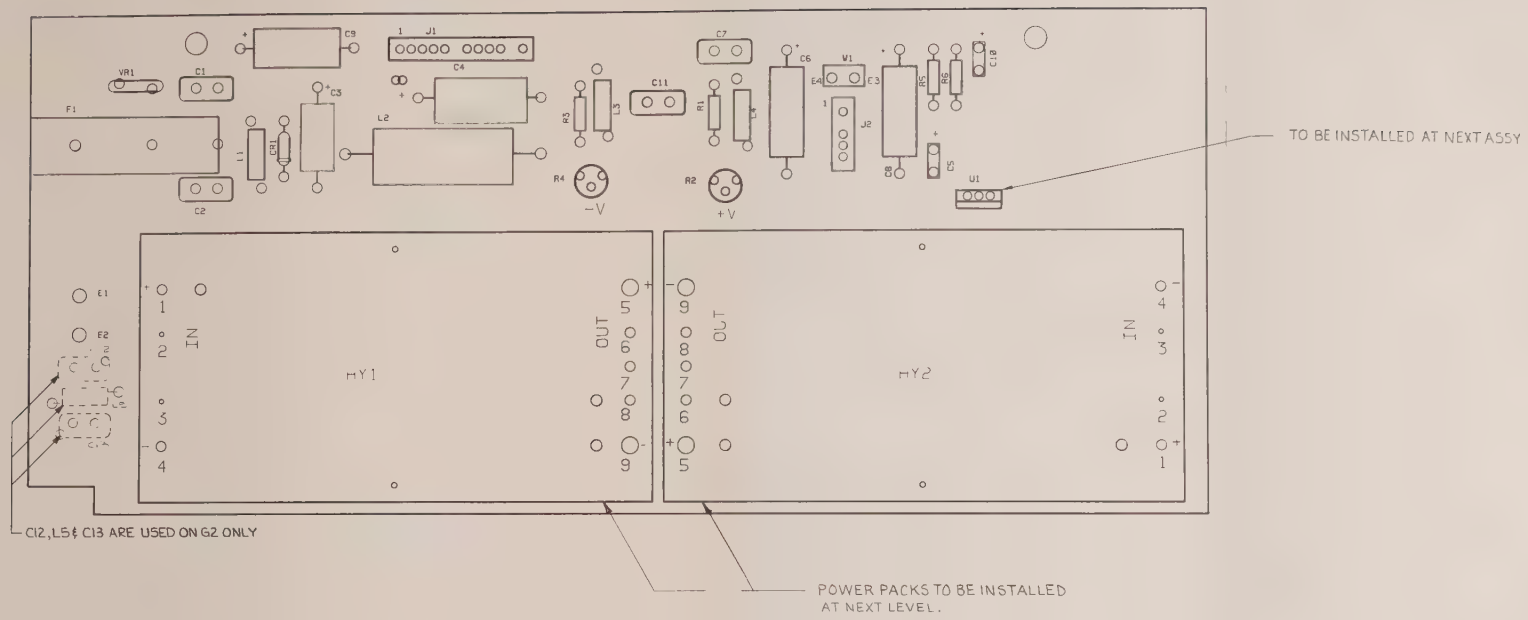
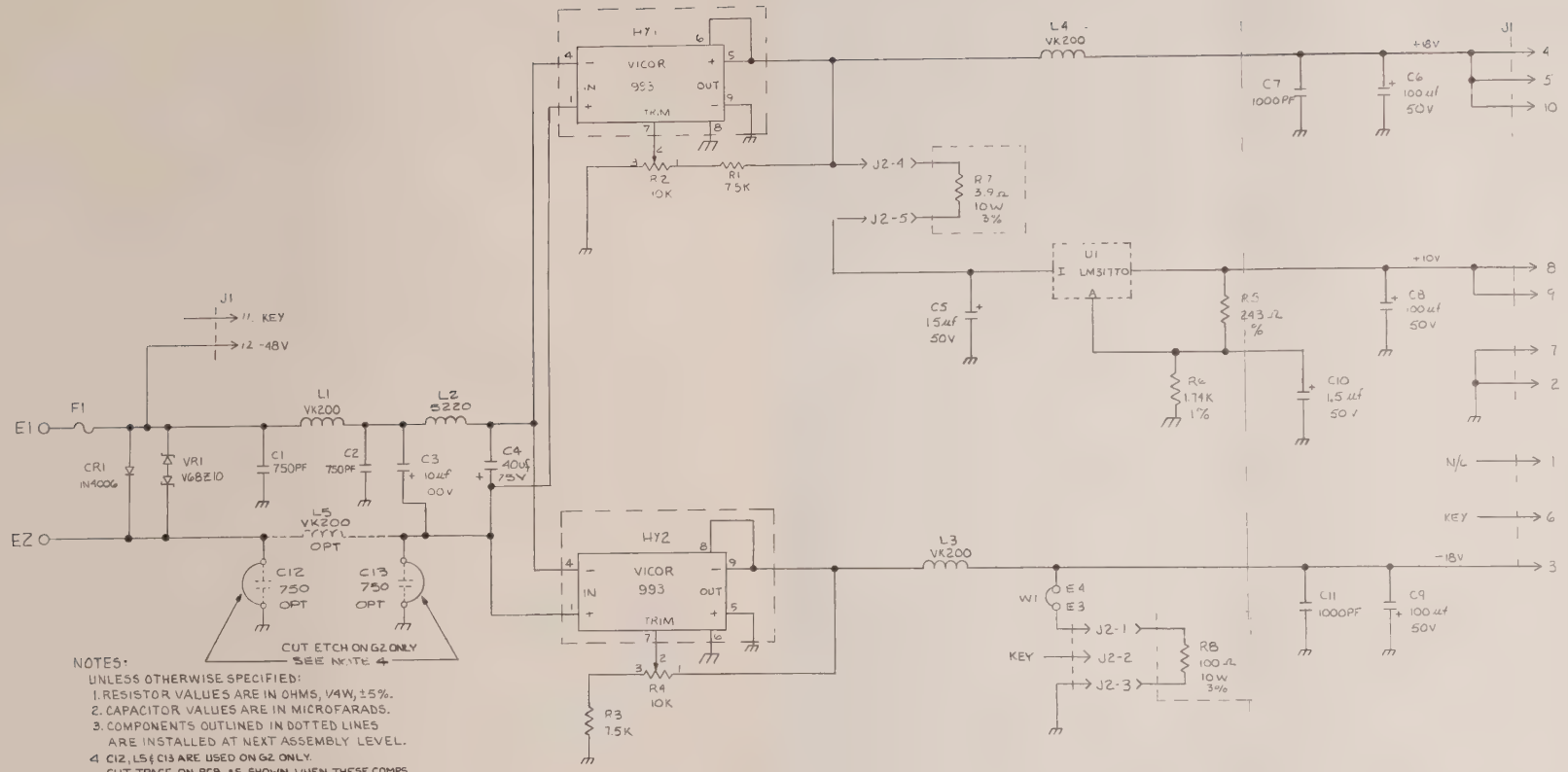


Figure 5-13. DC/DC Converter – Component Locations PN 843512-1B



NOTES:
UNLESS OTHERWISE SPECIFIED:
1. RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
2. CAPACITOR VALUES ARE IN MICROFARADS.
3. COMPONENTS OUTLINED IN DOTTED LINES ARE INSTALLED AT NEXT ASSEMBLY LEVEL.
4. C12, L5 & C13 ARE USED ON G2 ONLY. CUT TRACE ON PCB AS SHOWN WHEN THESE COMPS ARE INSTALLED

Figure 5-14. DC/DC Converter – Schematic Diagram
PN 843512-1B

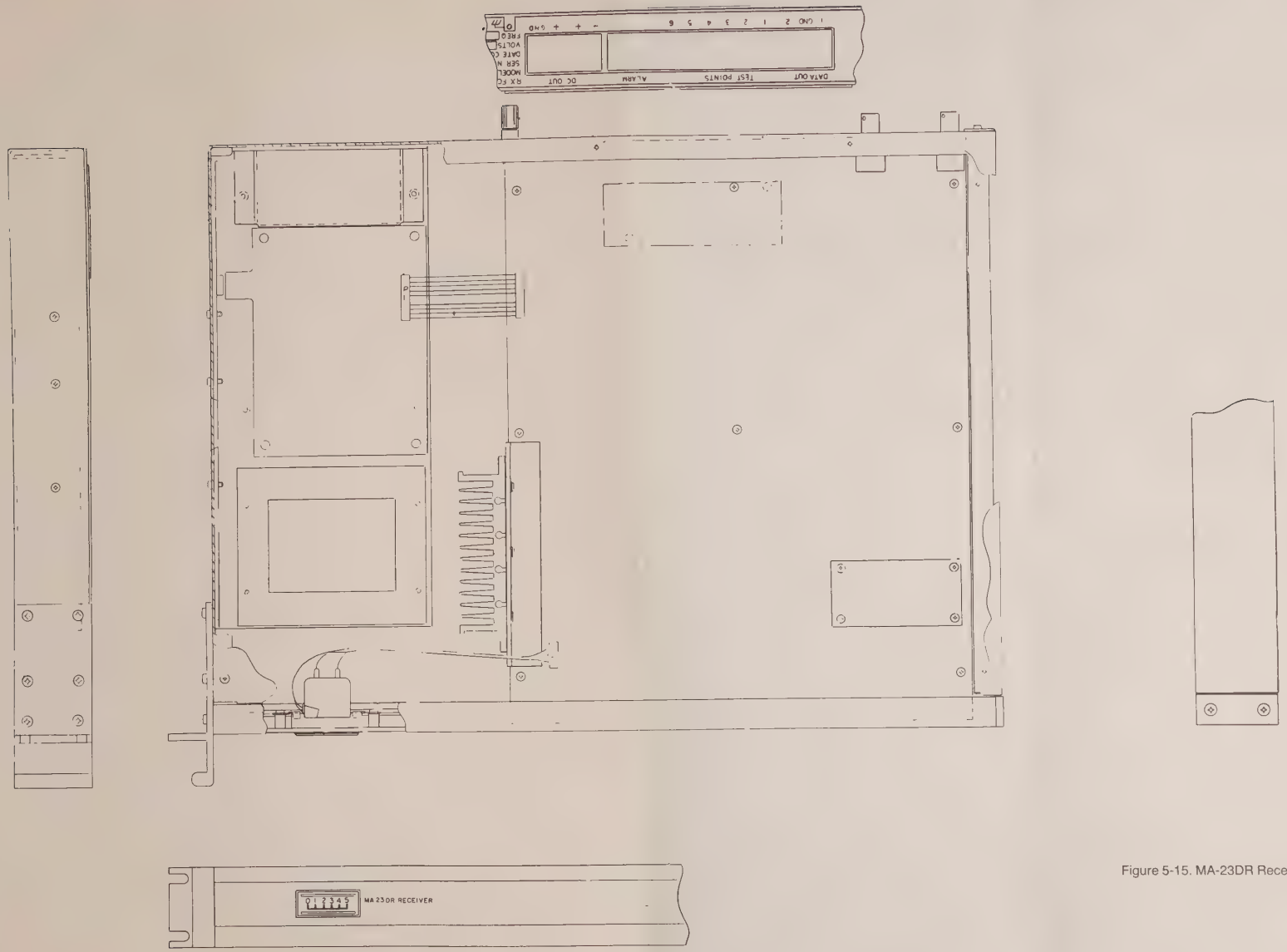


Figure 5-15. MA-23DR Receiver Assembly
PN 1841560G

(THIS PAGE LEFT INTENTIONALLY BLANK)

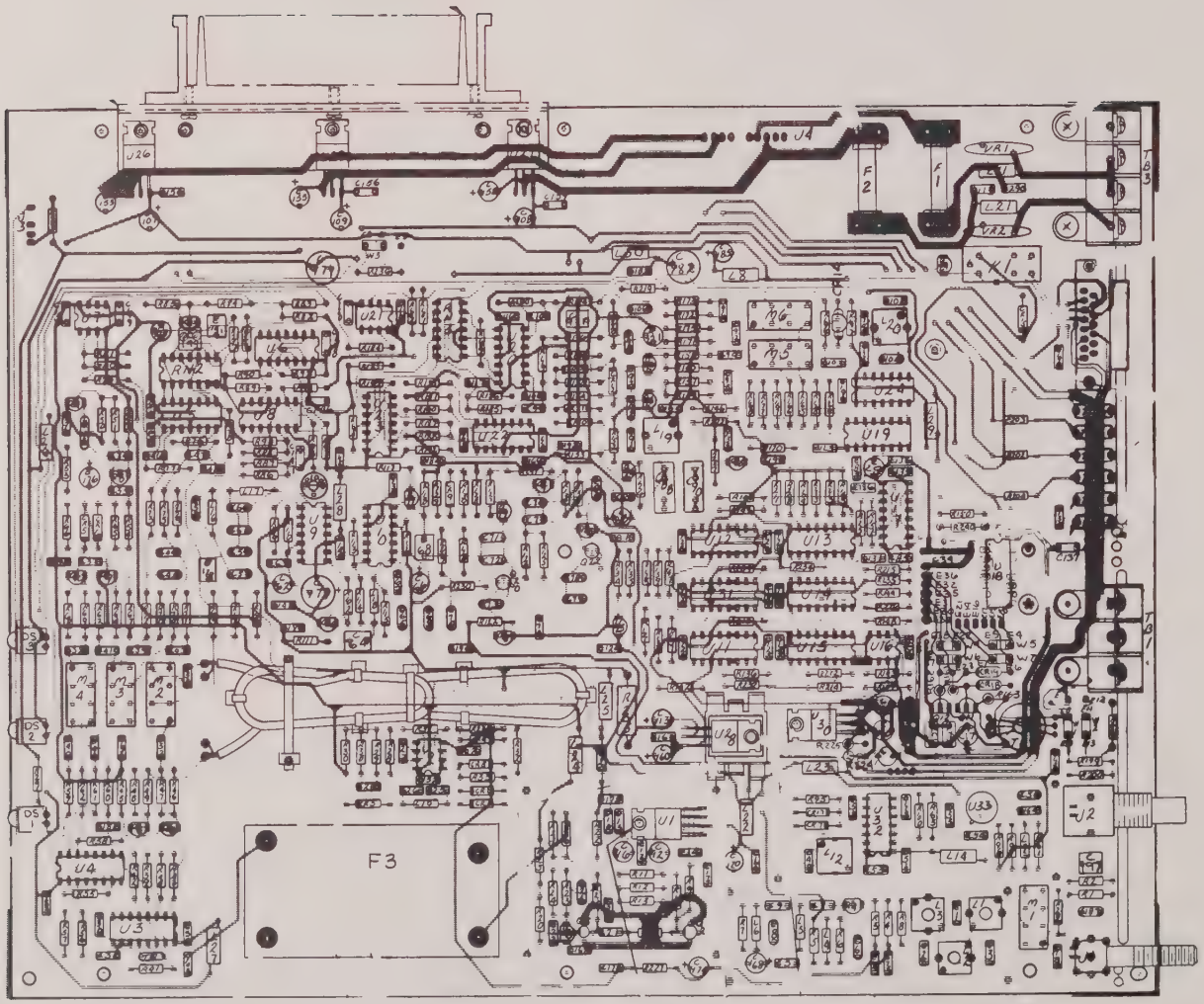


Figure 5-16. Receiver Baseband Board – Component Locations PN 1841562S

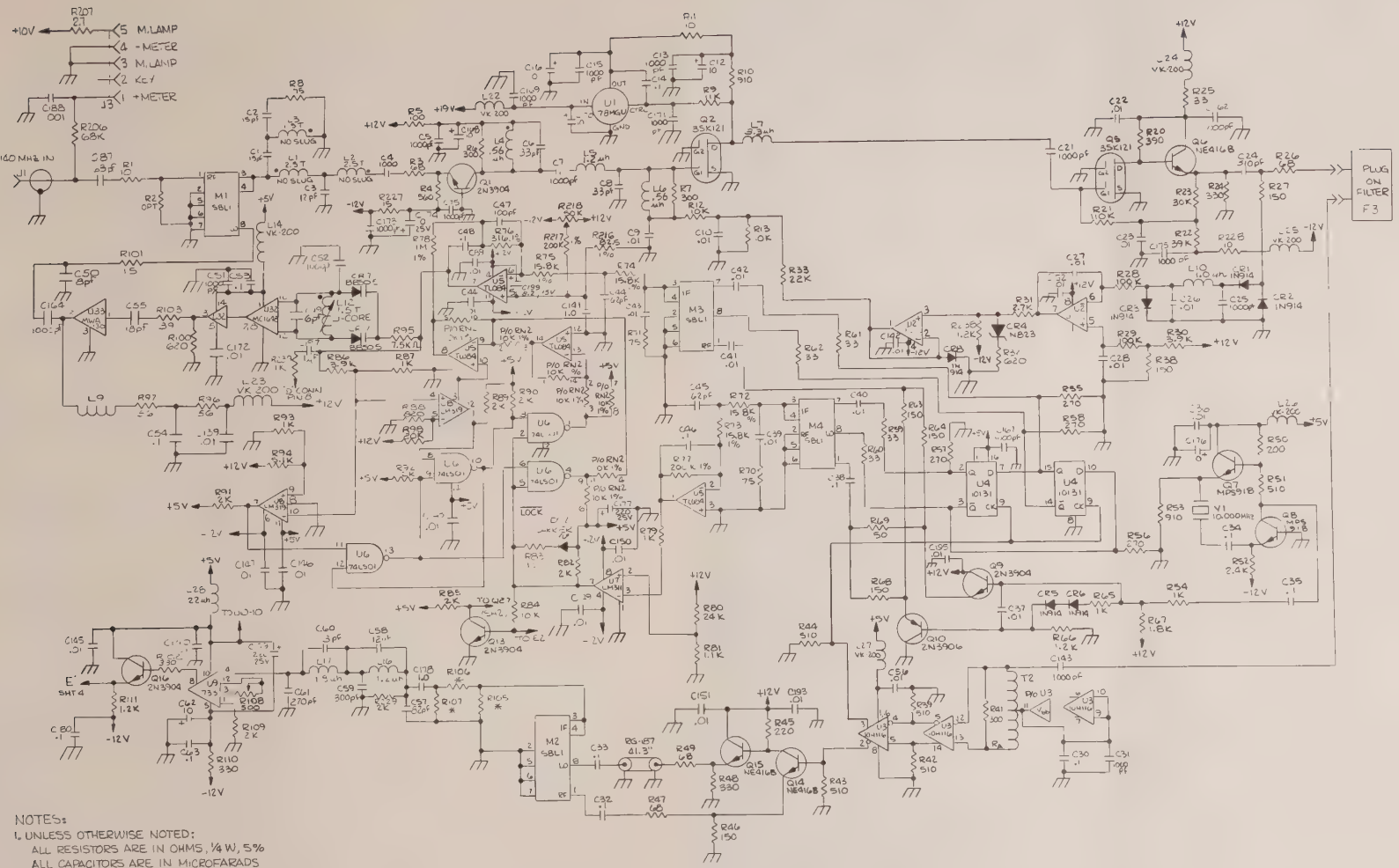


Figure 5-17. Receiver Baseband Board – Schematic Diagram PN 1841562S (Sheet 1 of 2)

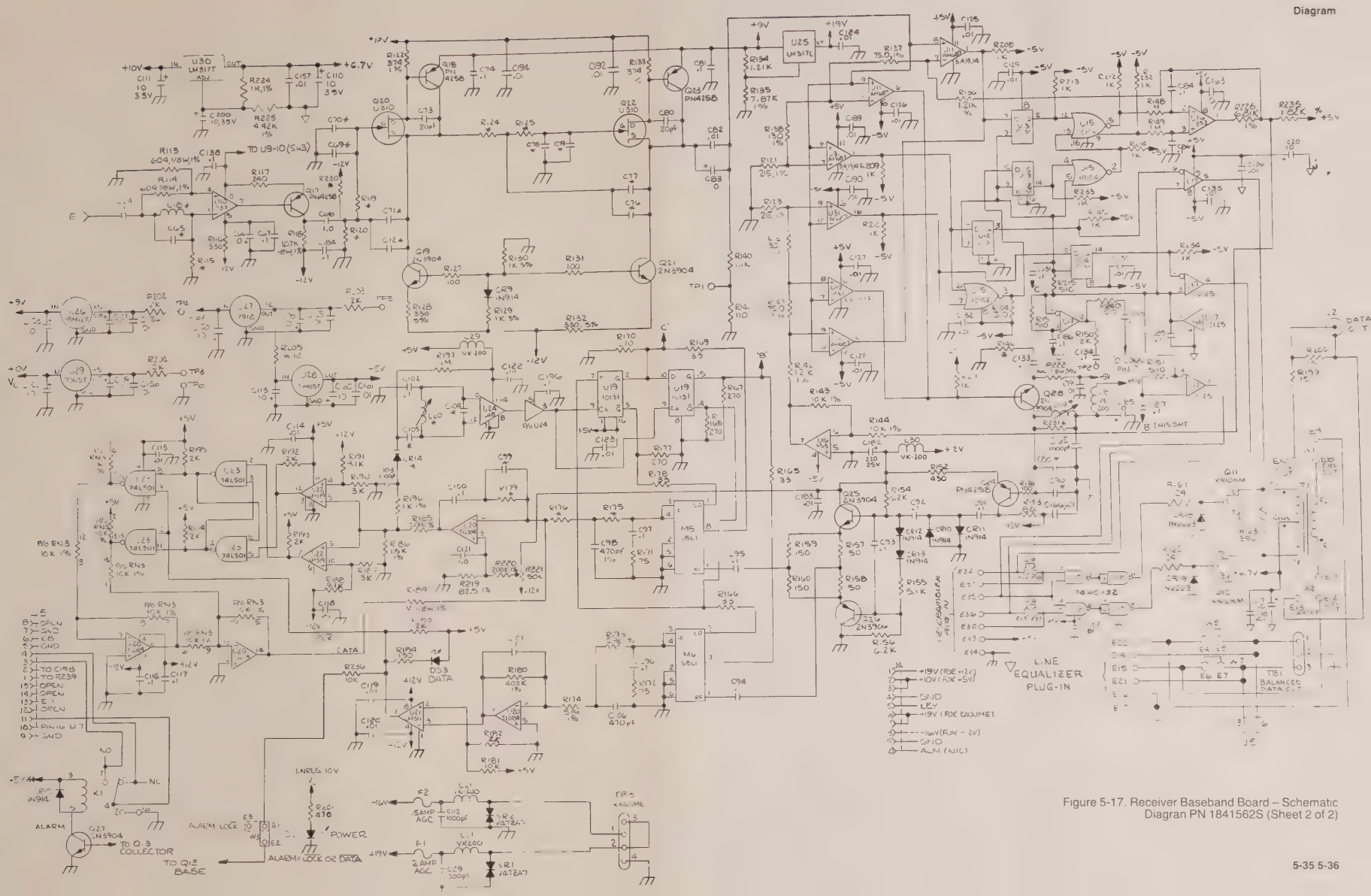
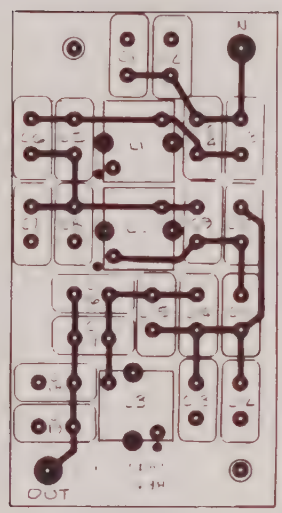


Figure 5-17. Receiver Baseband Board – Schematic Diagran PN 1841562S (Sheet 2 of 2)



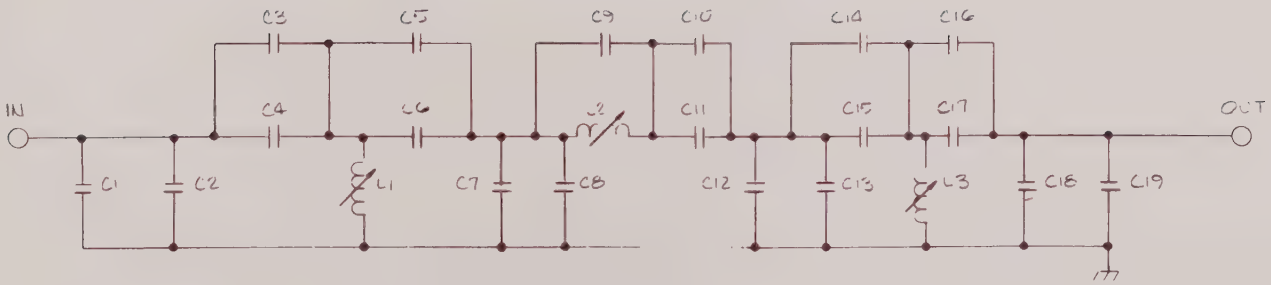
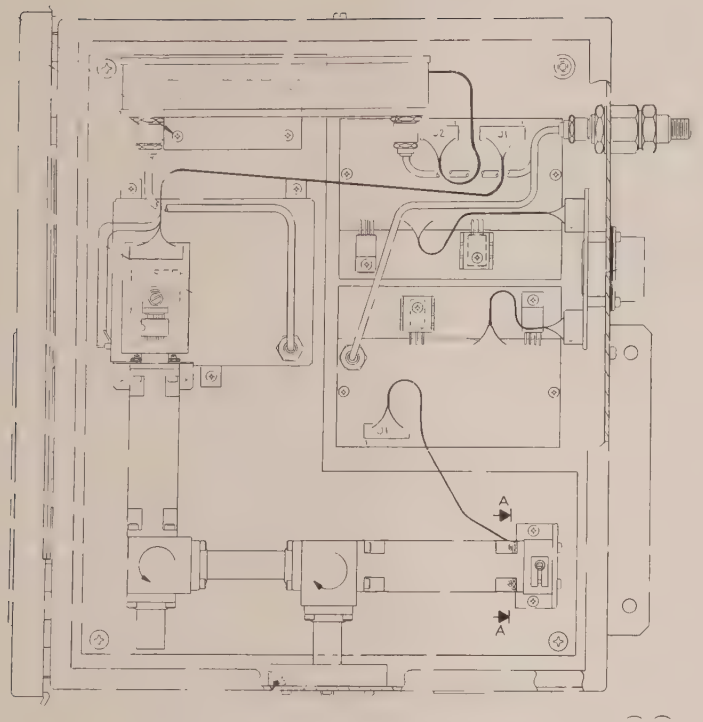
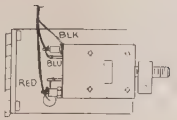


Figure 5-18. 40 MHz IF Filter Board – Component Locations/Schematic Diagram PN 1841578E

(THIS PAGE LEFT INTENTIONALLY BLANK)





VIEW A-A
TX SOURCE MIC NO.
SCALE - FULL

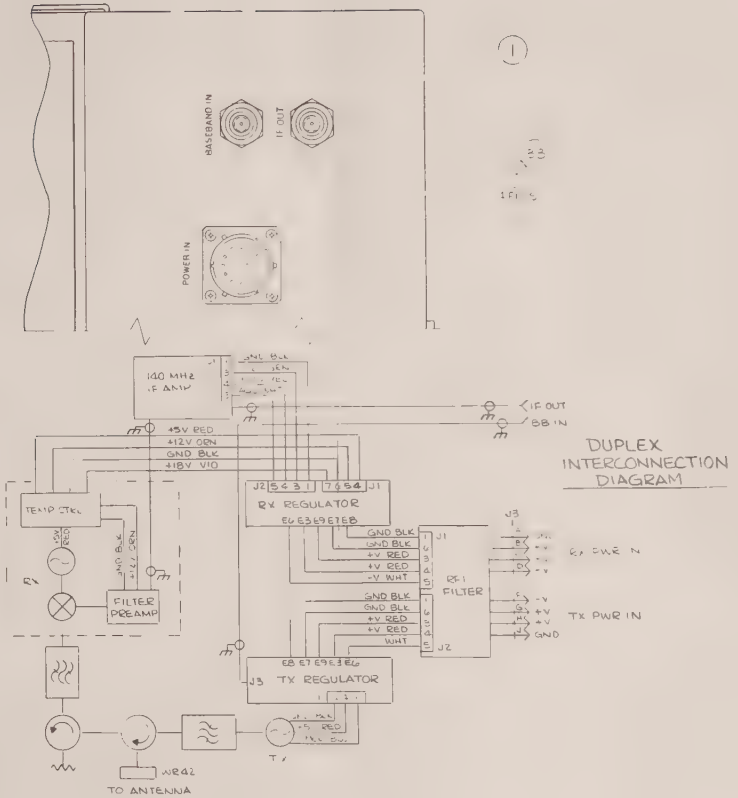
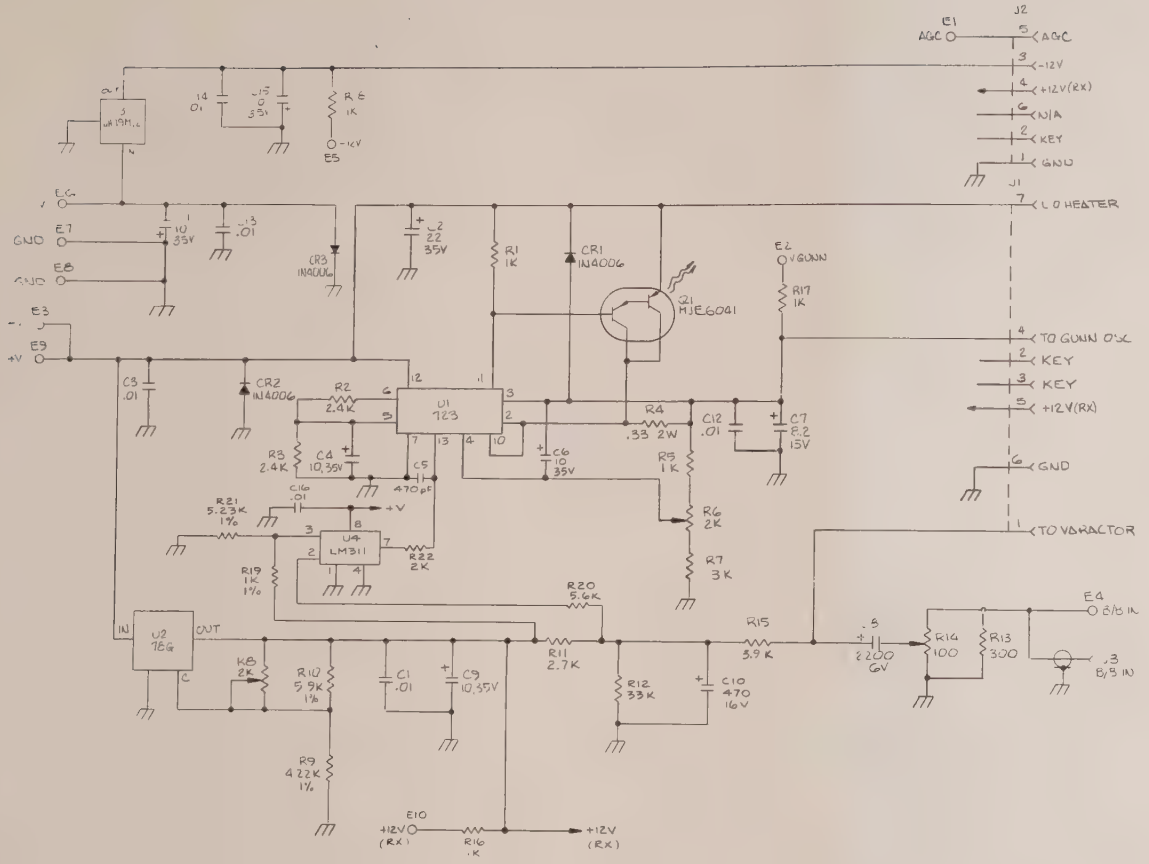


Figure 5-19. RF Box Assembly PN 181478H



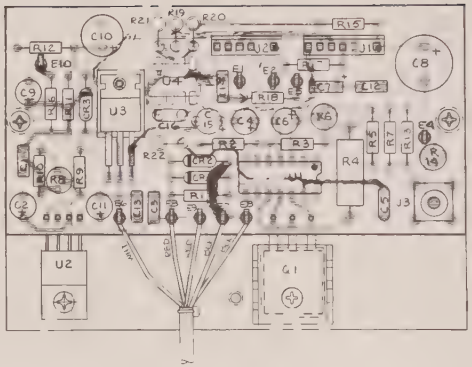
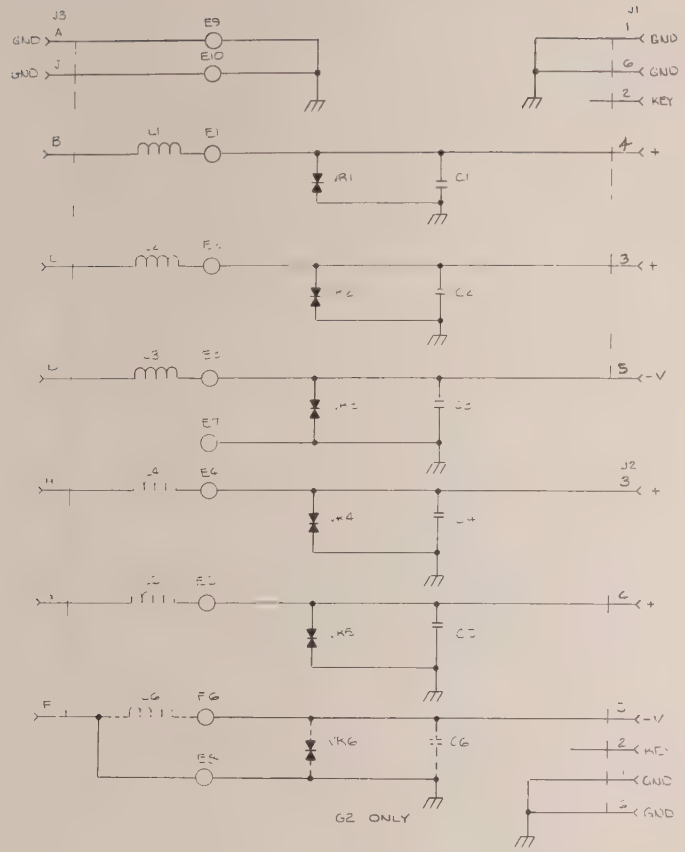


Figure 5-20. Transmitter Regulator – Component Locations/Schematic Diagram PN 1841788K



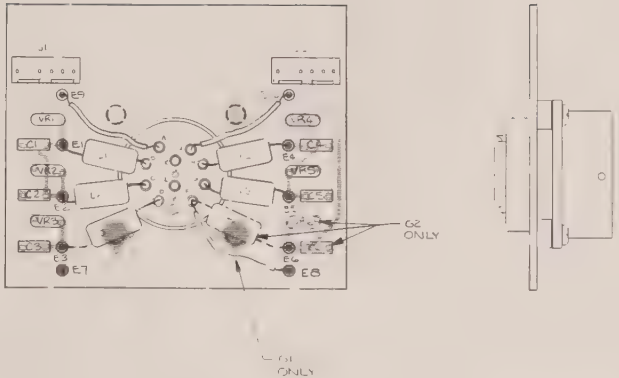
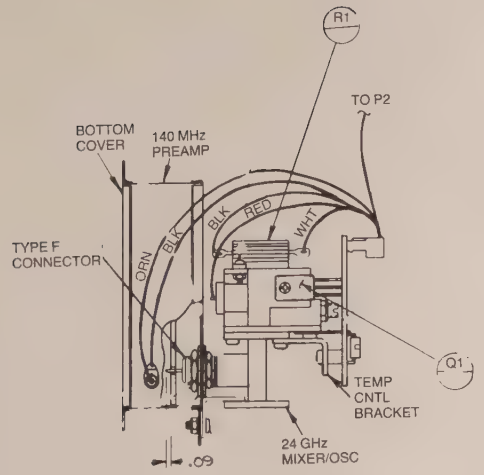
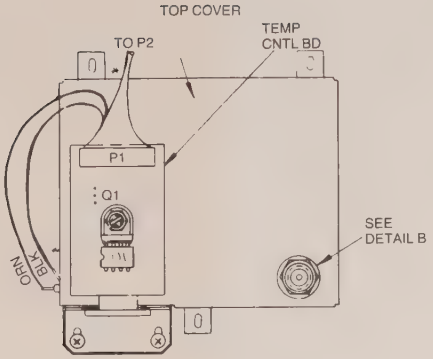
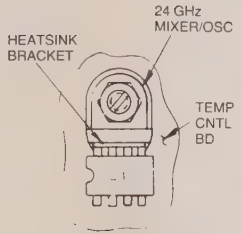


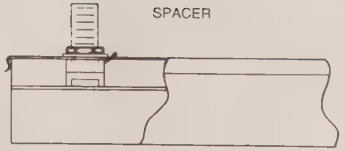
Figure 5-21. RFI Filter – Component Locations/ Schematic Diagram PN 1841720E







DETAIL A
SCALE: NONE
INSTALLATION OF
HEATSINK BKT



DETAIL B
SCALE: NONE

Figure 5-22. Receiver Mixer/Oscillator/Preamplifier Assembly PN 842870C

(THIS PAGE LEFT INTENTIONALLY BLANK)

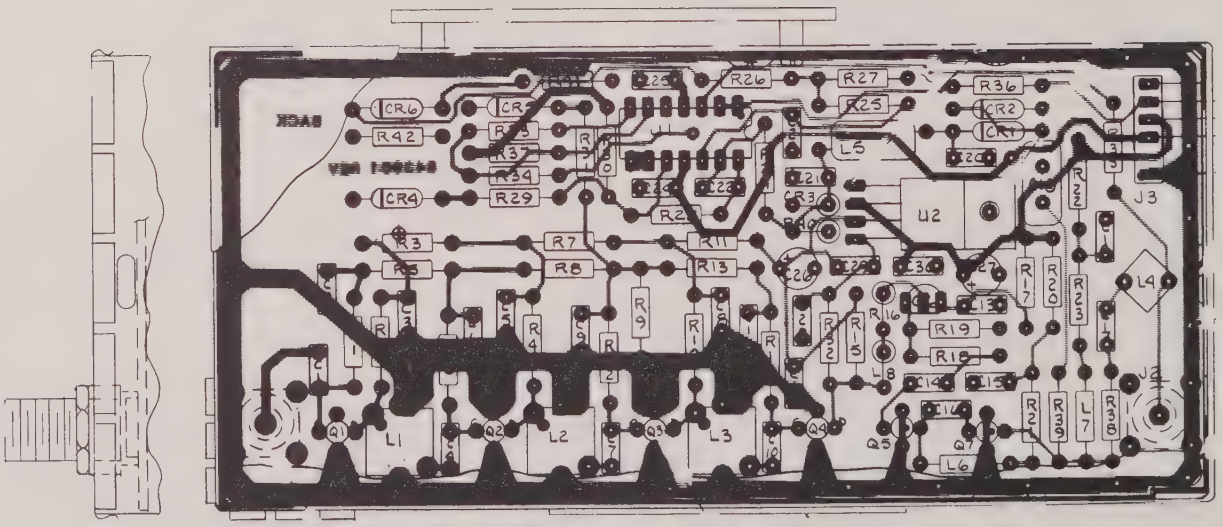


Figure 5-23. 140 MHz IF Amplifier – Component Locations PN 1843901-1A

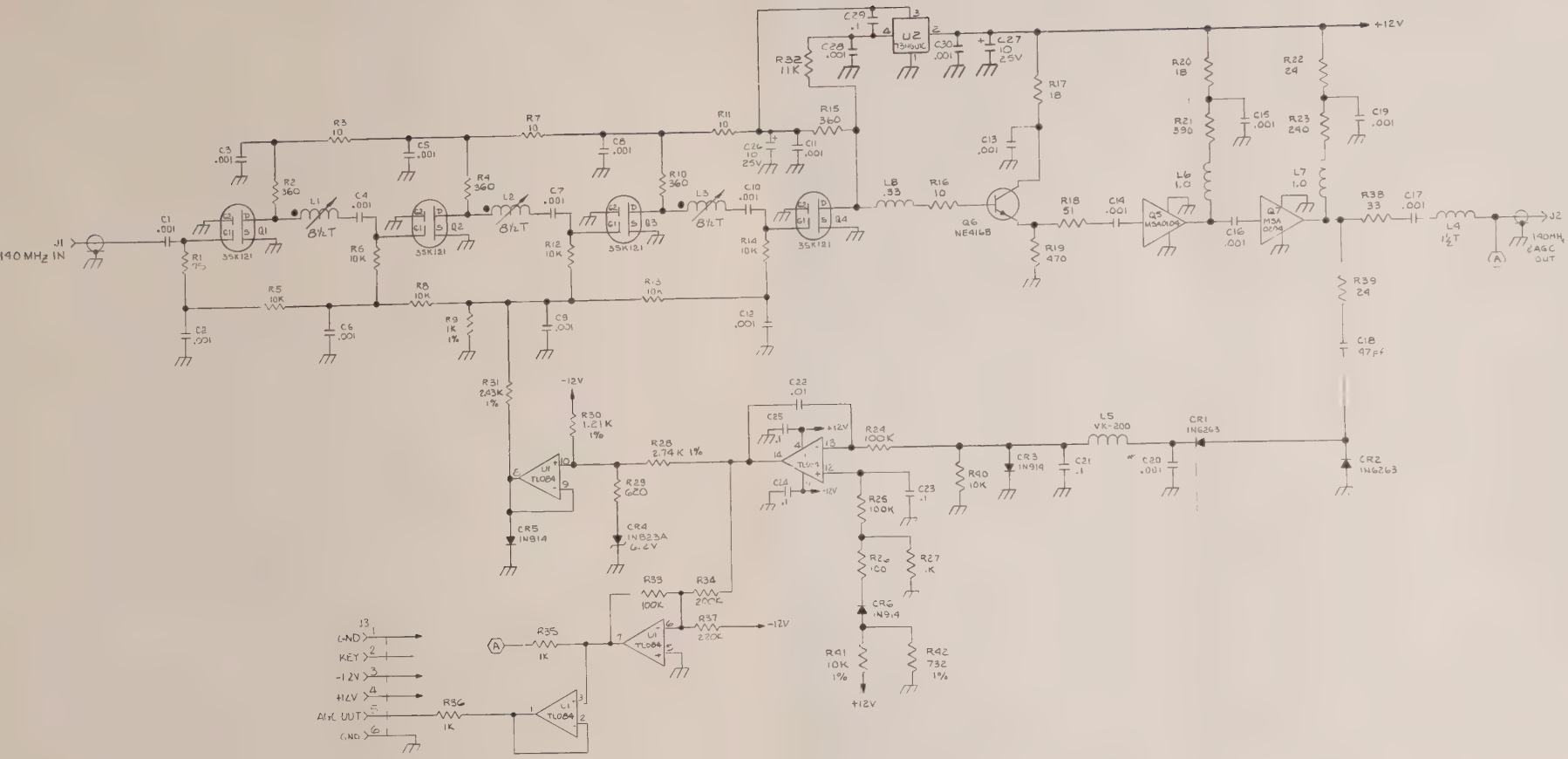


Figure 5-24. 140 MHz IF Amplifier – Schematic Diagram PN 1843901-1A

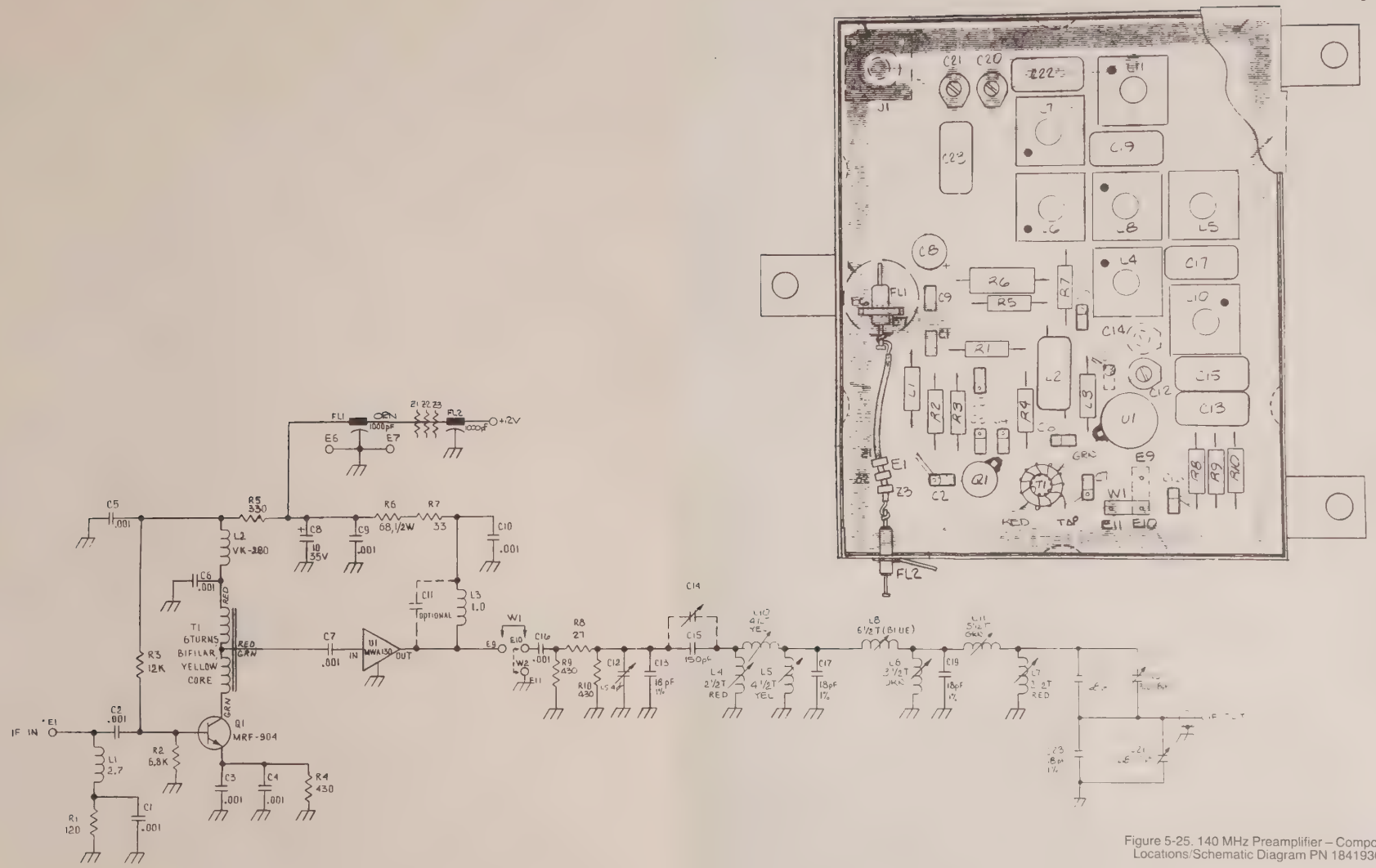


Figure 5-25. 140 MHz Preamplifier – Component Locations/Schematic Diagram PN 1841936-1G

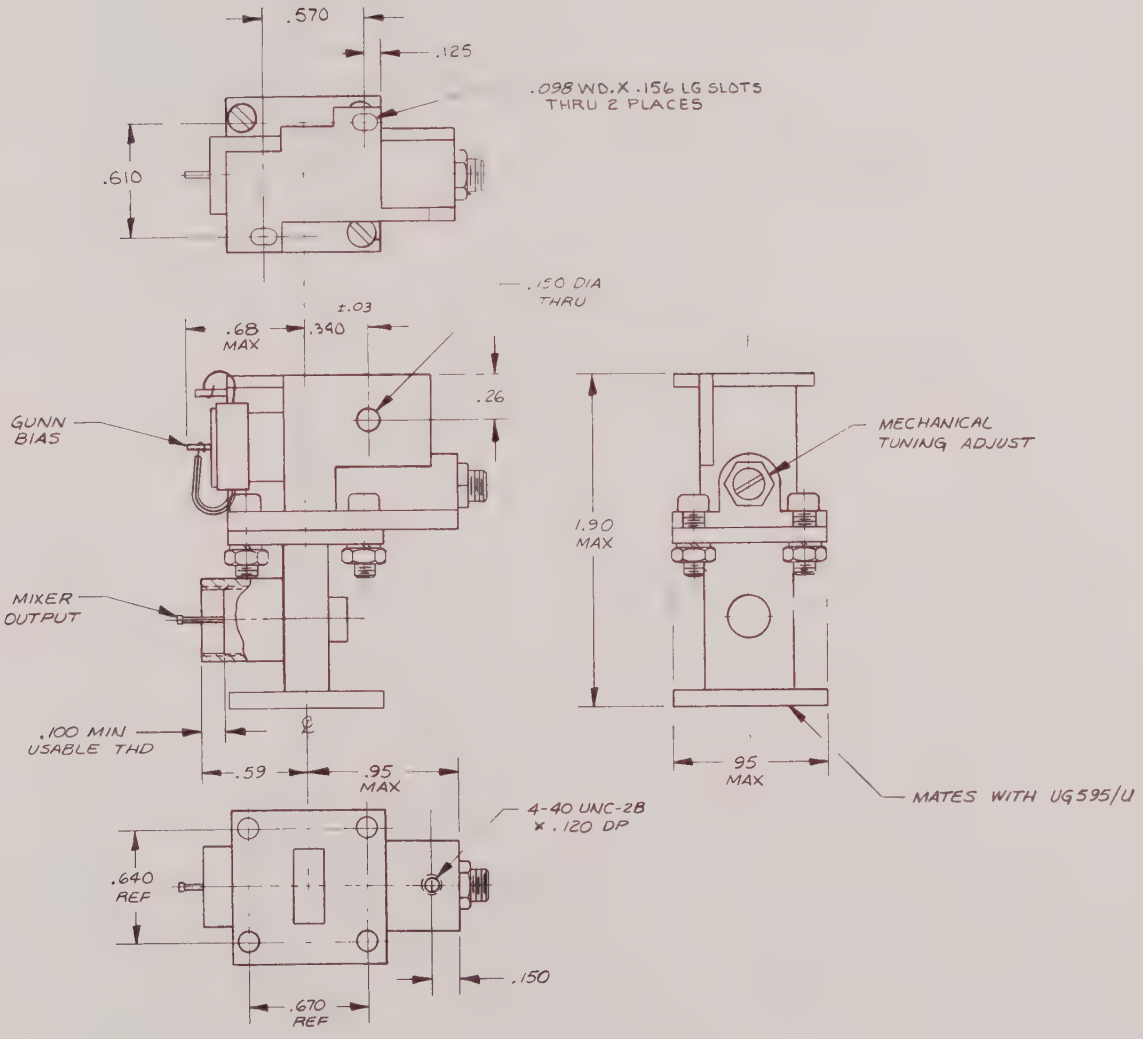


Figure 5-26. 24 GHz Mixer/Oscillator Assembly PN 842871C

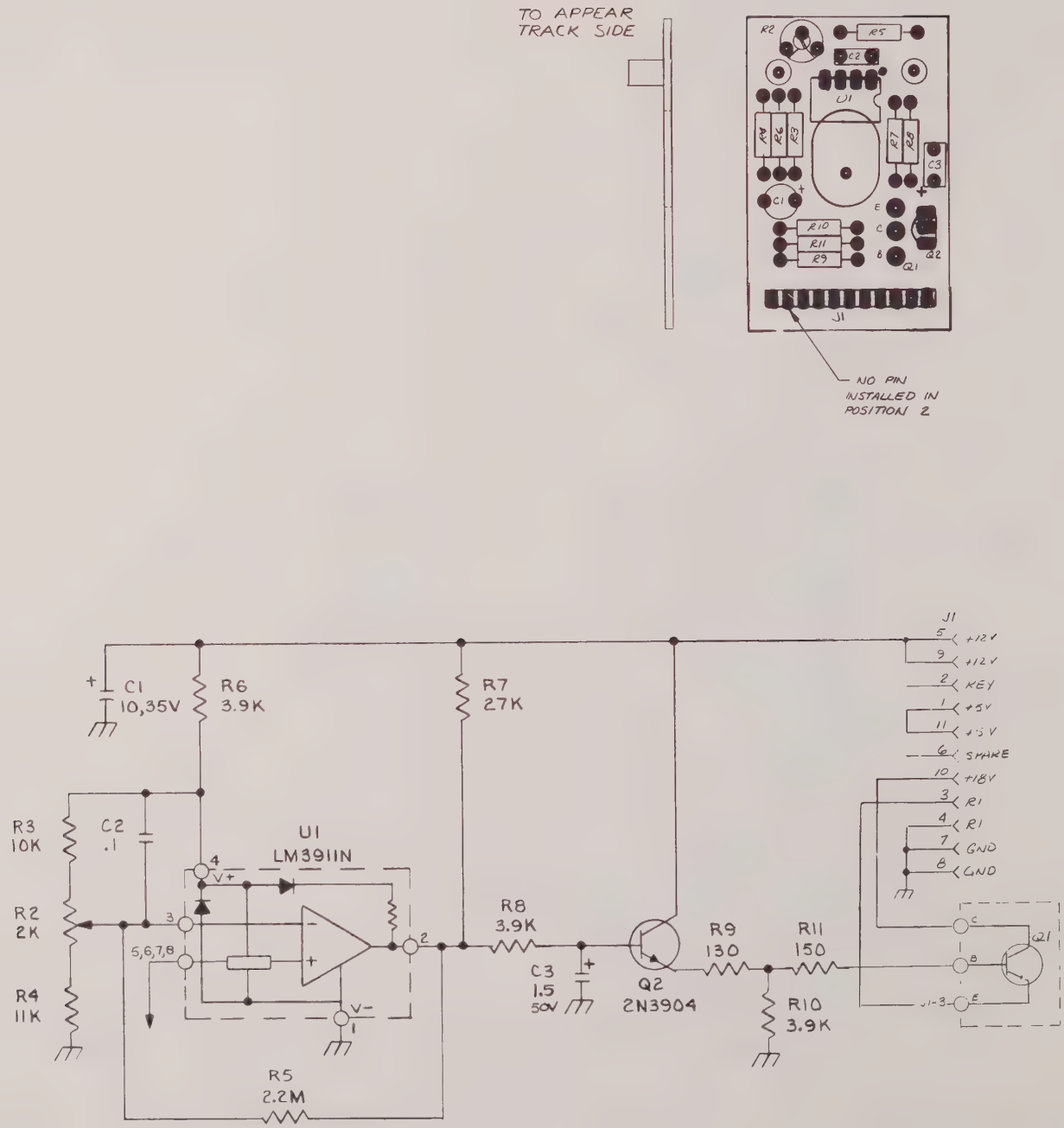
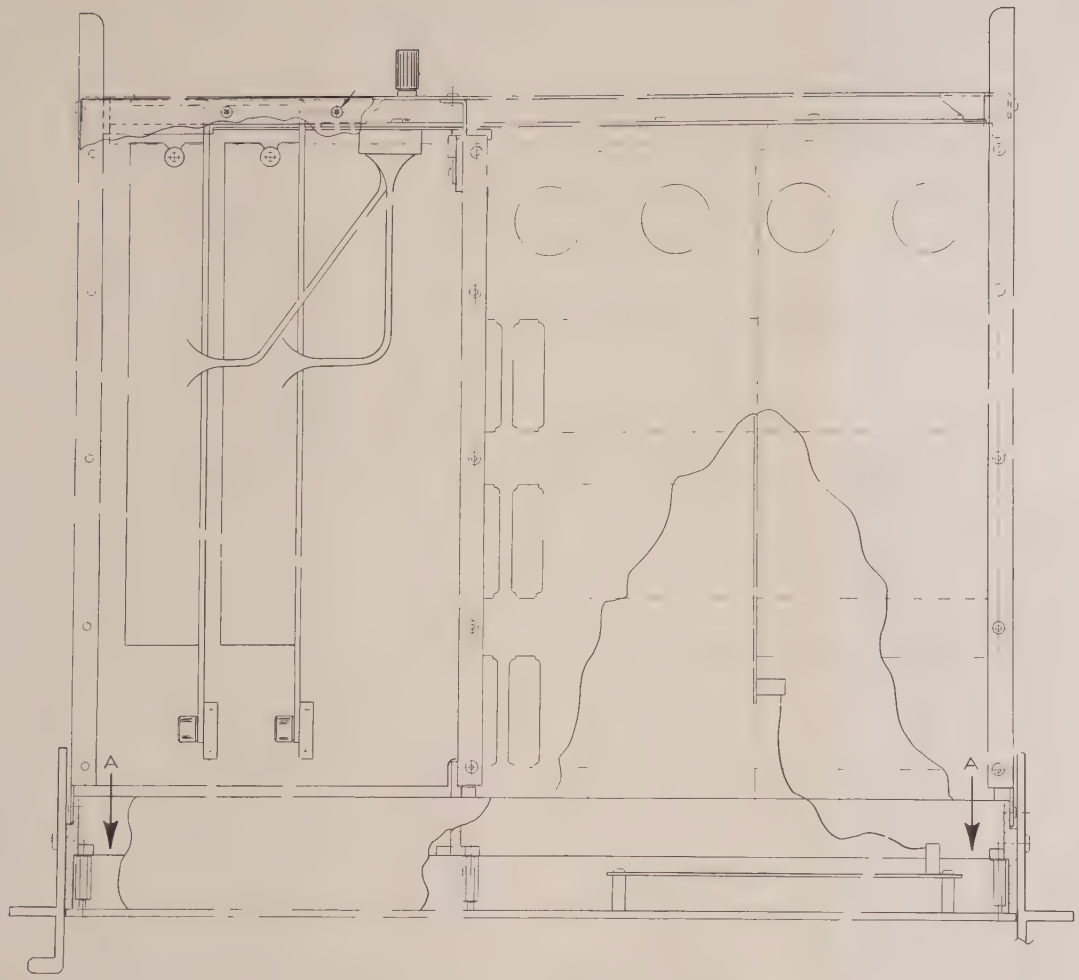


Figure 5-27. Temperature Control Board PN 842744-1B



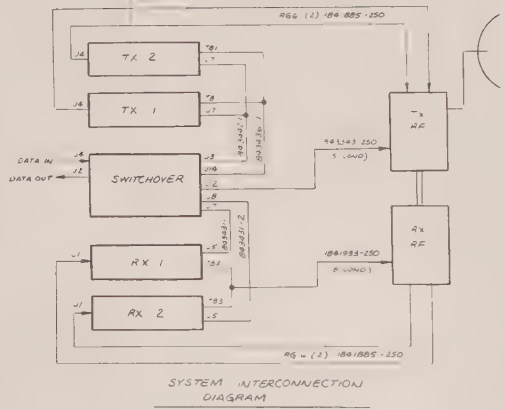
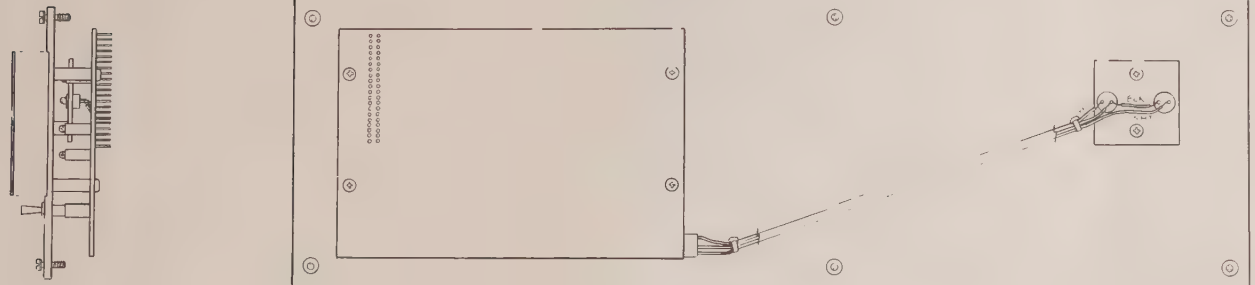


Figure 5-28. Hot Standby Switch Assembly PN 842340C (Sheet 1 of 2)



VIEW A-A (ROTATED)
FRONT PANEL ASSEMBLY

Figure 5-28. Hot Standby Switch Assembly
PN 842340C (Sheet 2 of 2)

(THIS PAGE LEFT INTENTIONALLY BLANK)

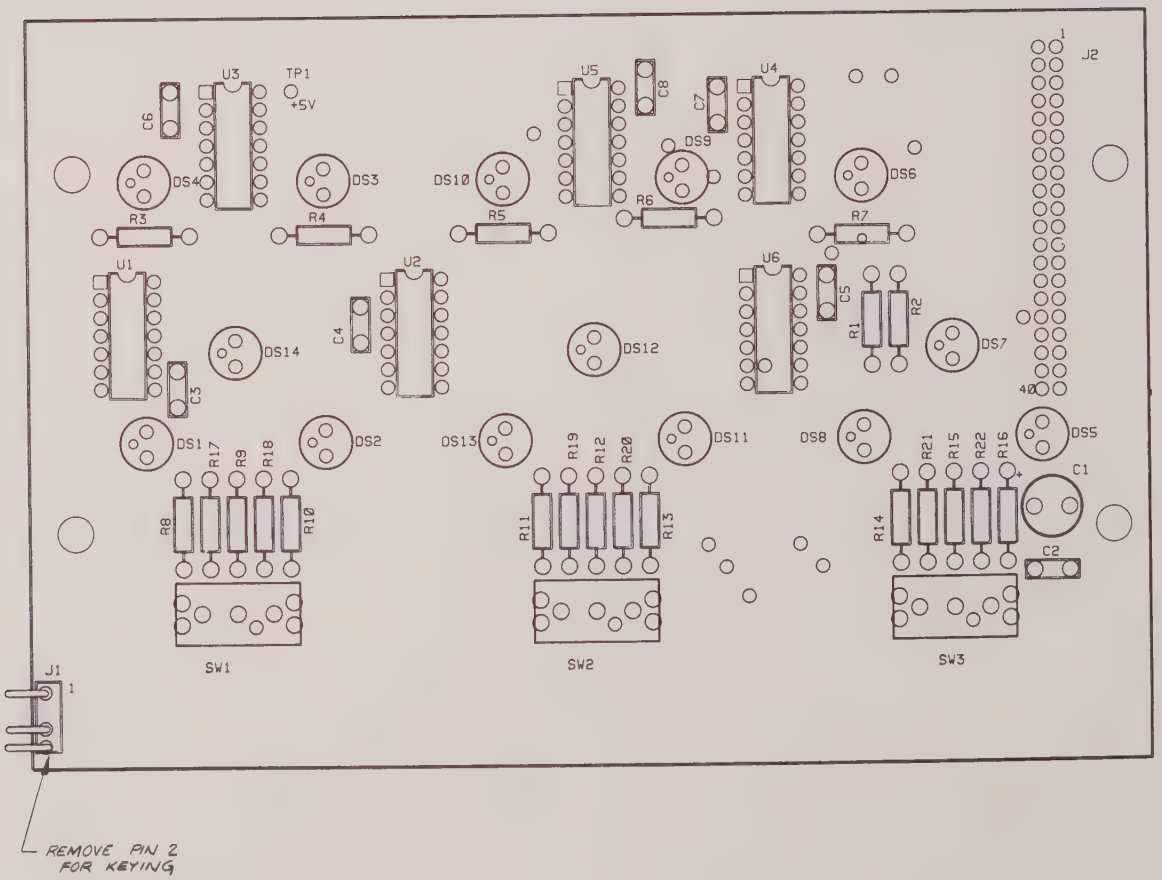


Figure 5-29. Display Board – Component Locations PN 843330-1B

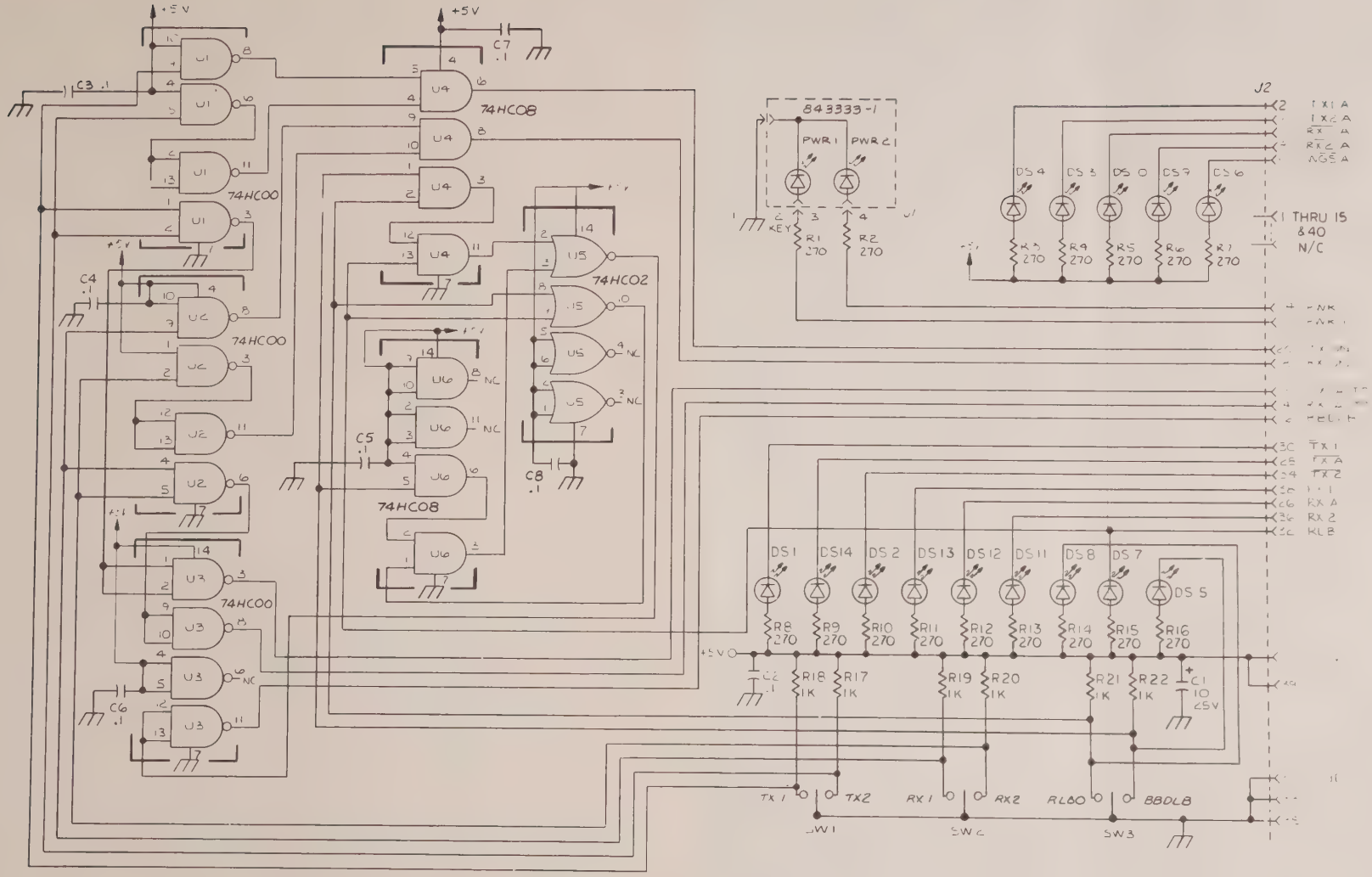


Figure 5-30. Display Board – Schematic Diagram PN 843330-1B

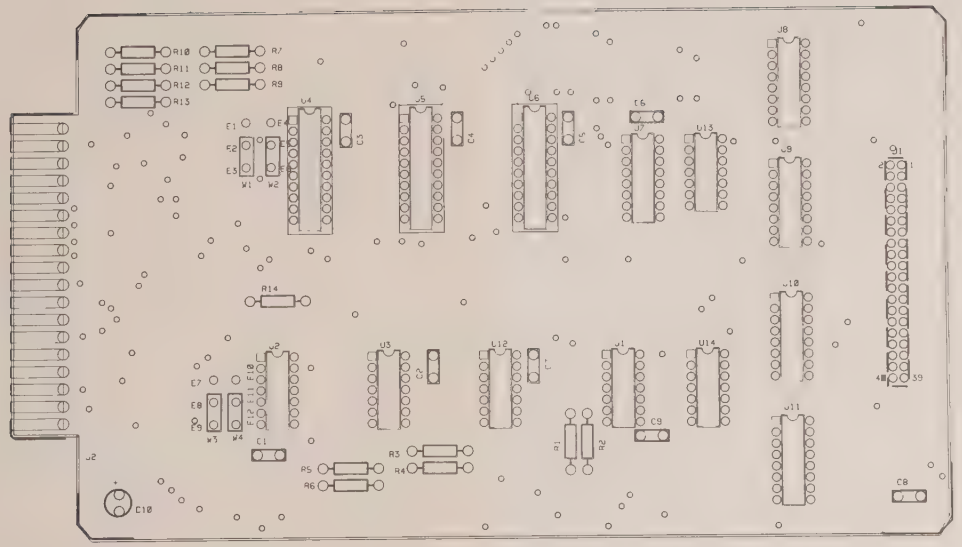


Figure 5-31. Control Logic – Component Locations
PN 843334-1A

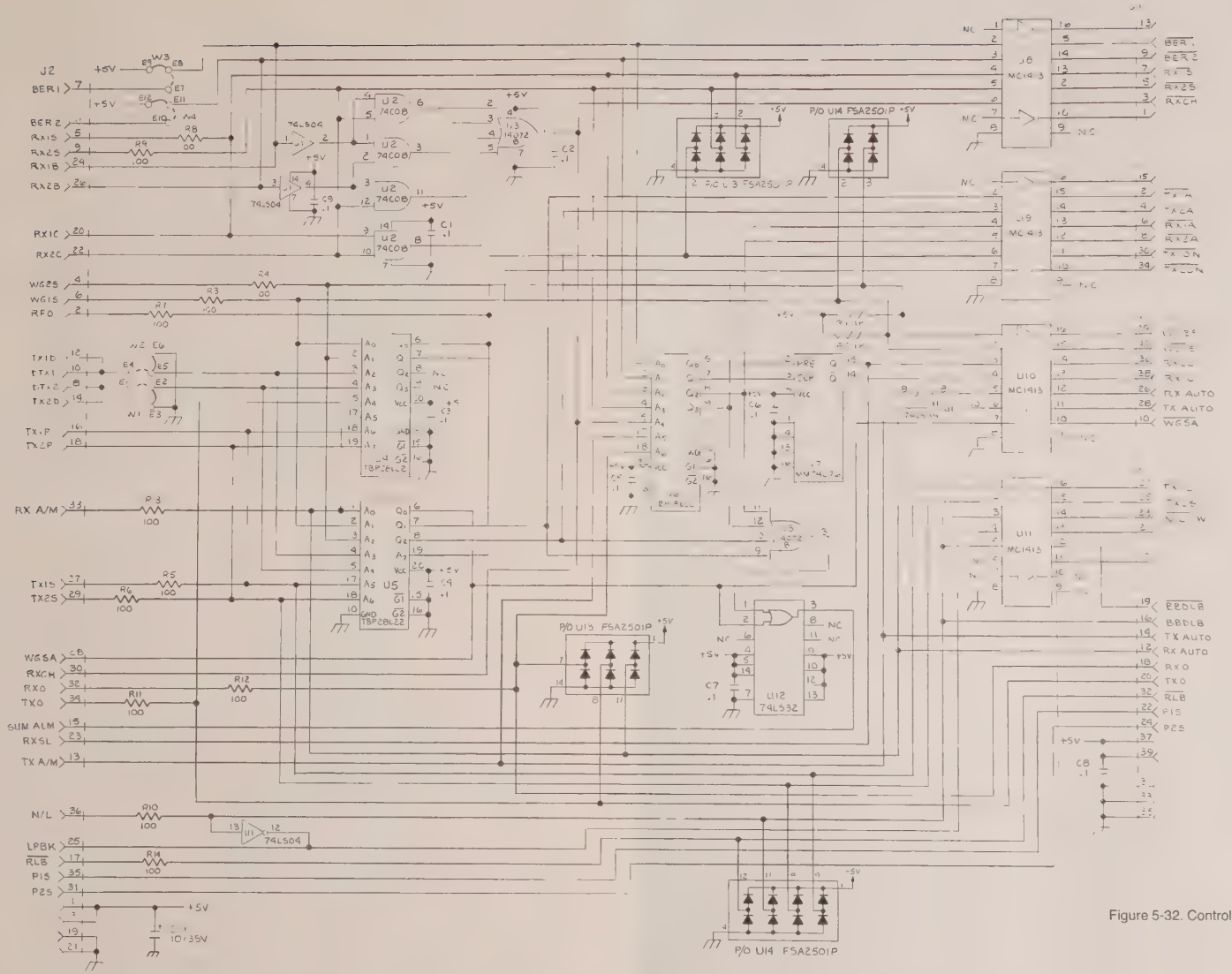


Figure 5-32. Control Logic – Schematic Diagram
PN 843334-1A

(THIS PAGE LEFT INTENTIONALLY BLANK)

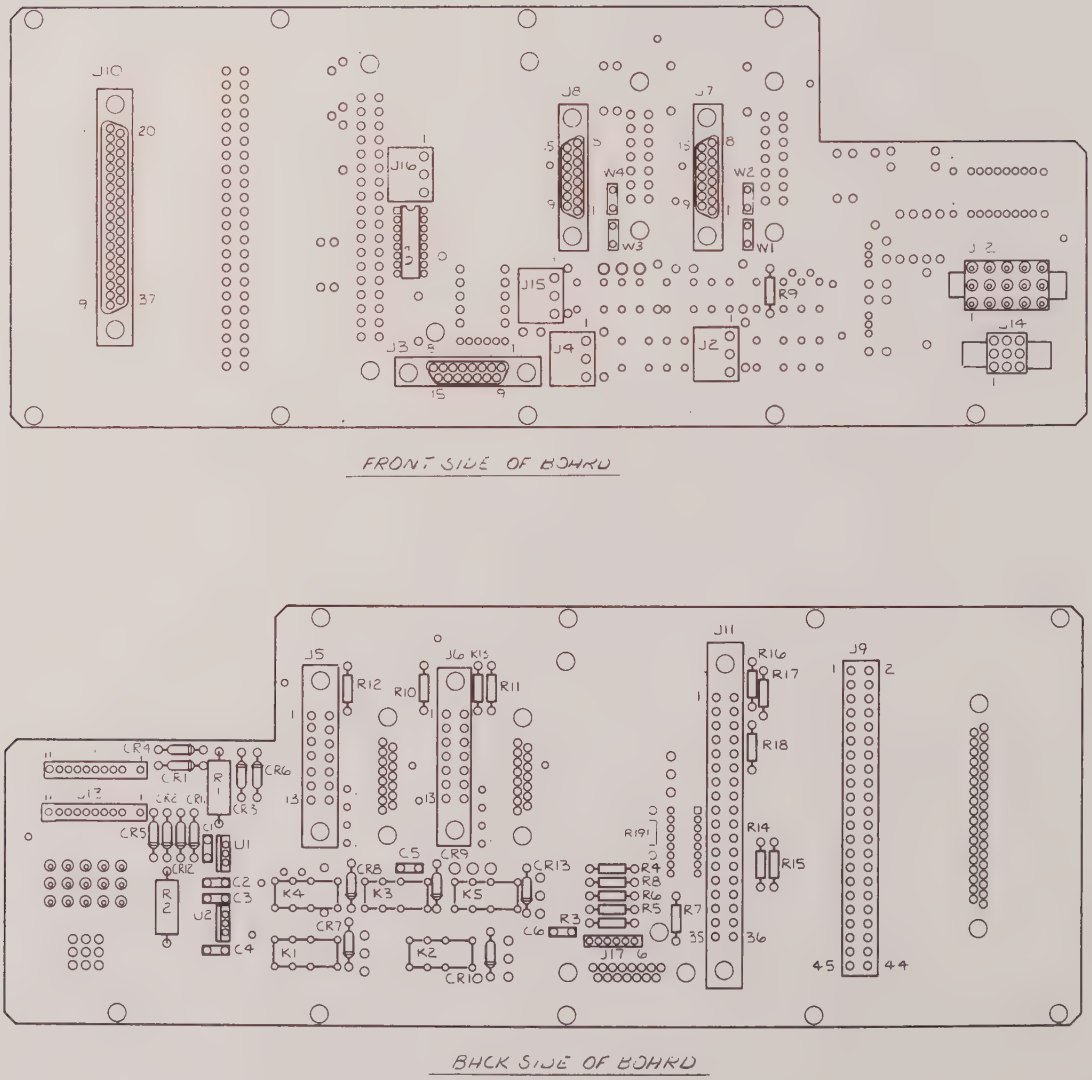


Figure 5-33. Backplane – Component Locations PN 843332-1A

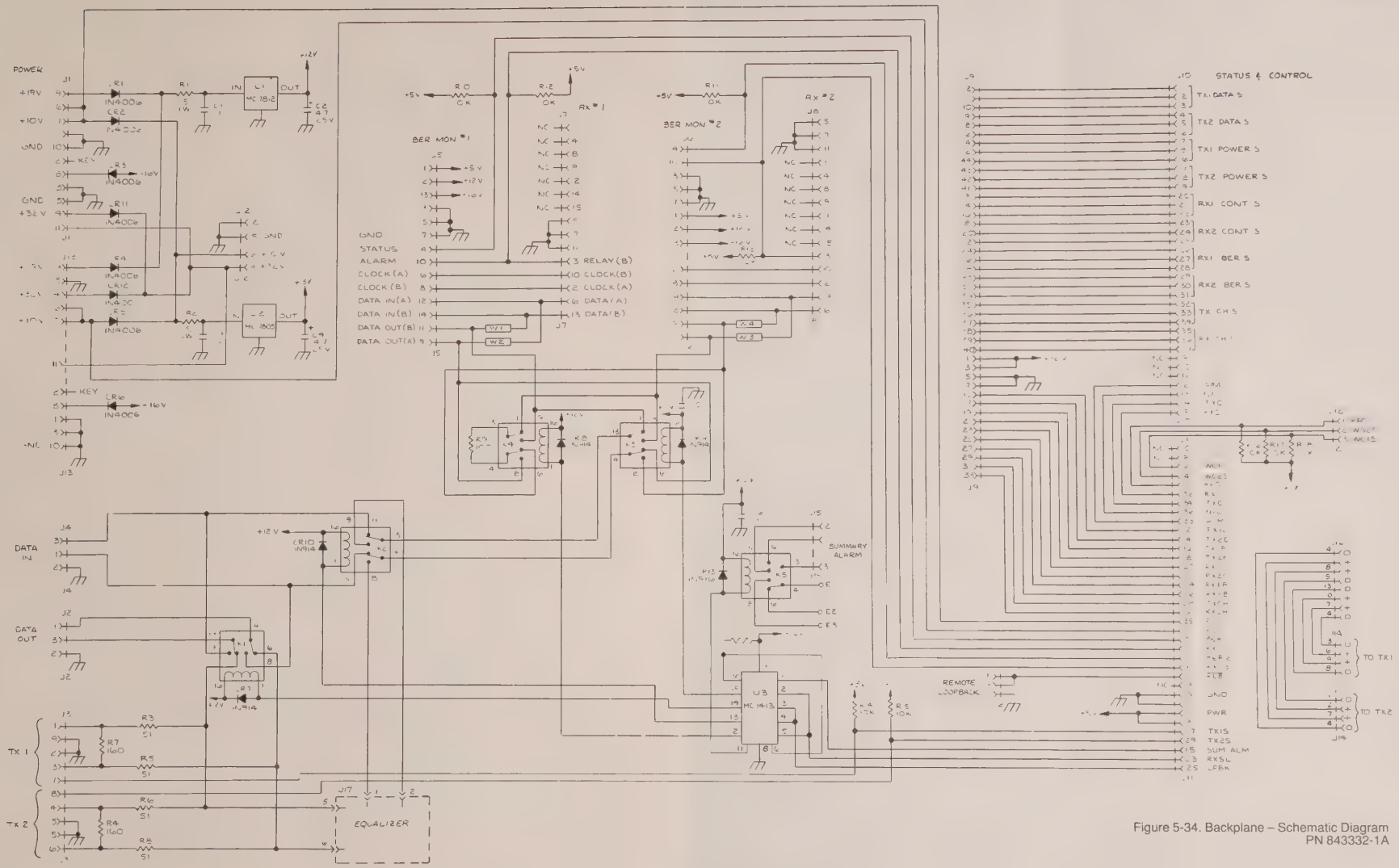


Figure 5-34. Backplane – Schematic Diagram
PN 843332-1A

(THIS PAGE LEFT INTENTIONALLY BLANK)

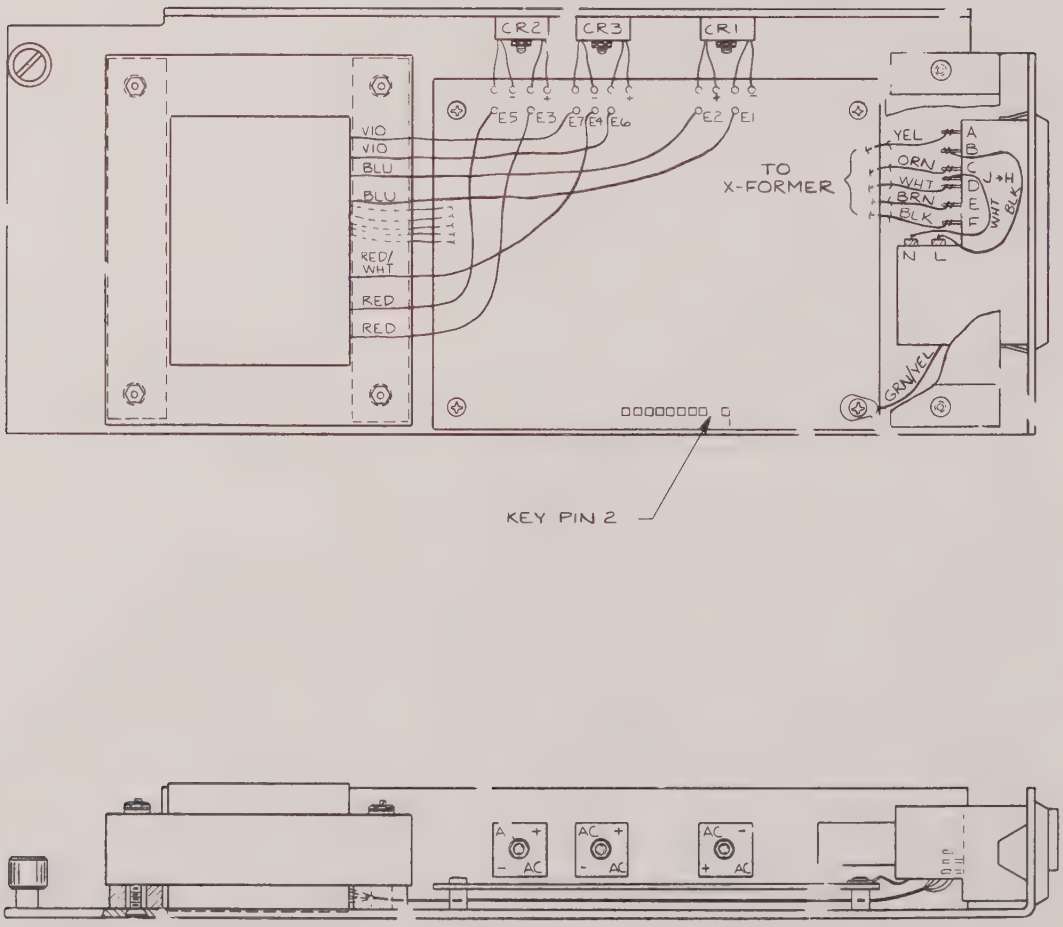


Figure 5-35. AC Power Supply – Component Locations PN 842640-1C

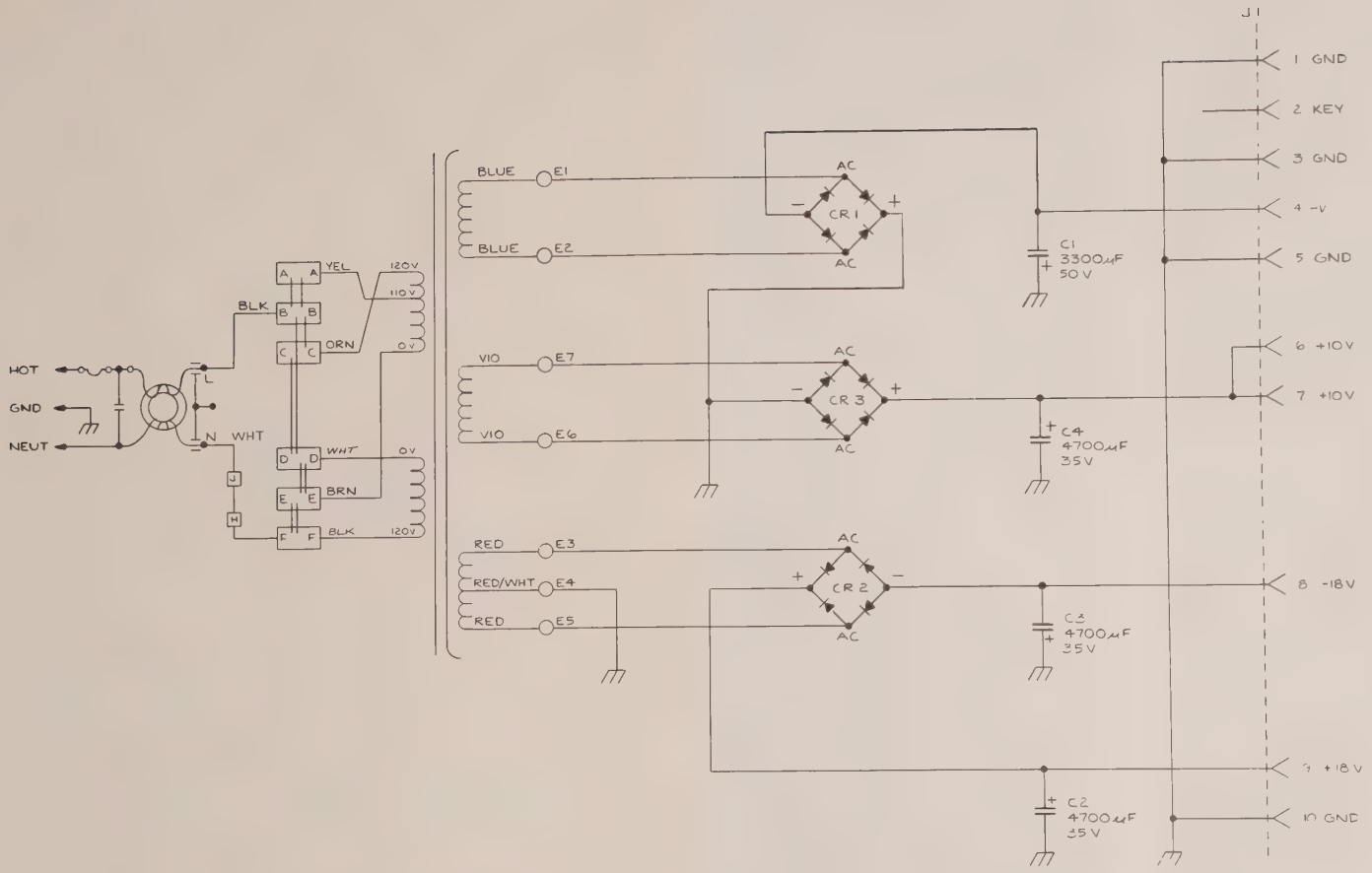


Figure 5-36. AC Power Supply – Schemtic Diagram PN 842640-1C

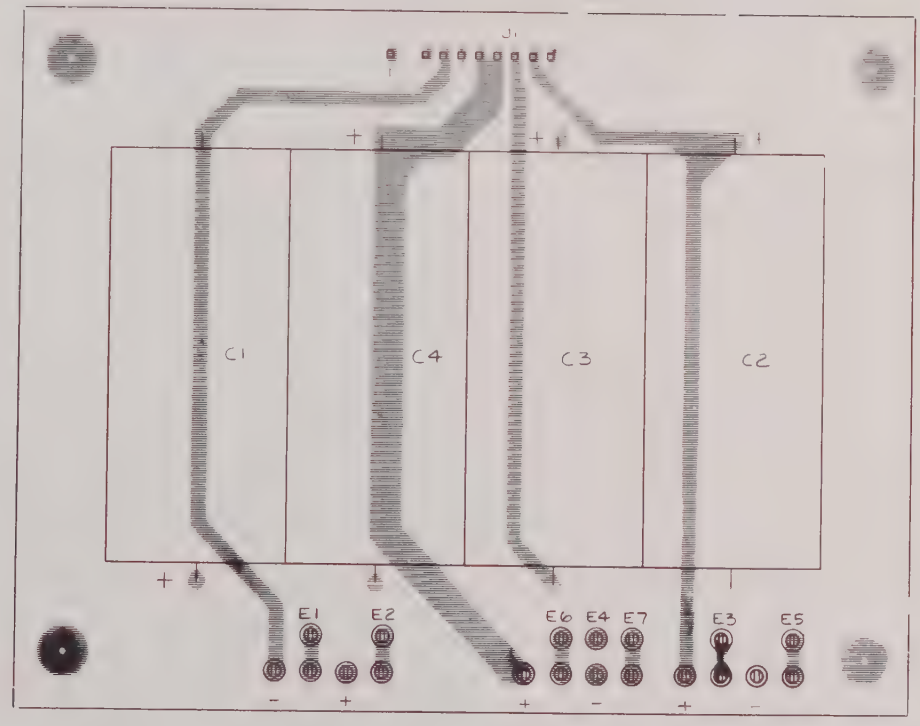


Figure 5-37. AC Power Supply – Component Locations PN 842642-1A

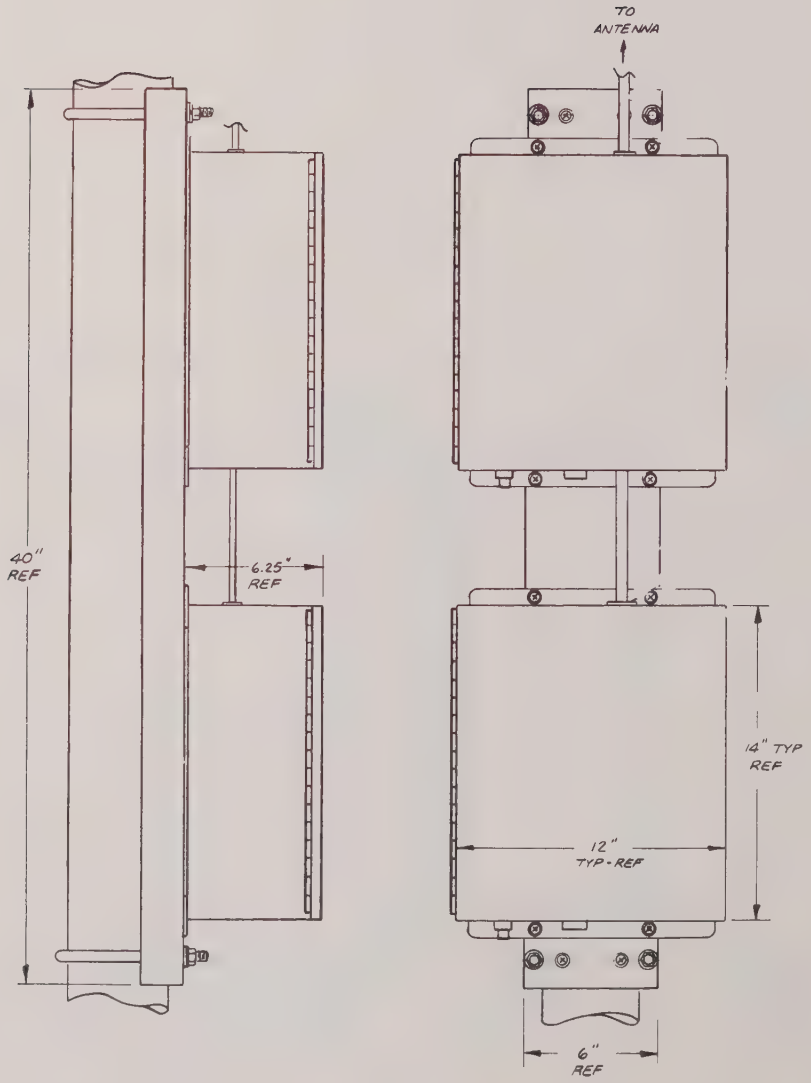
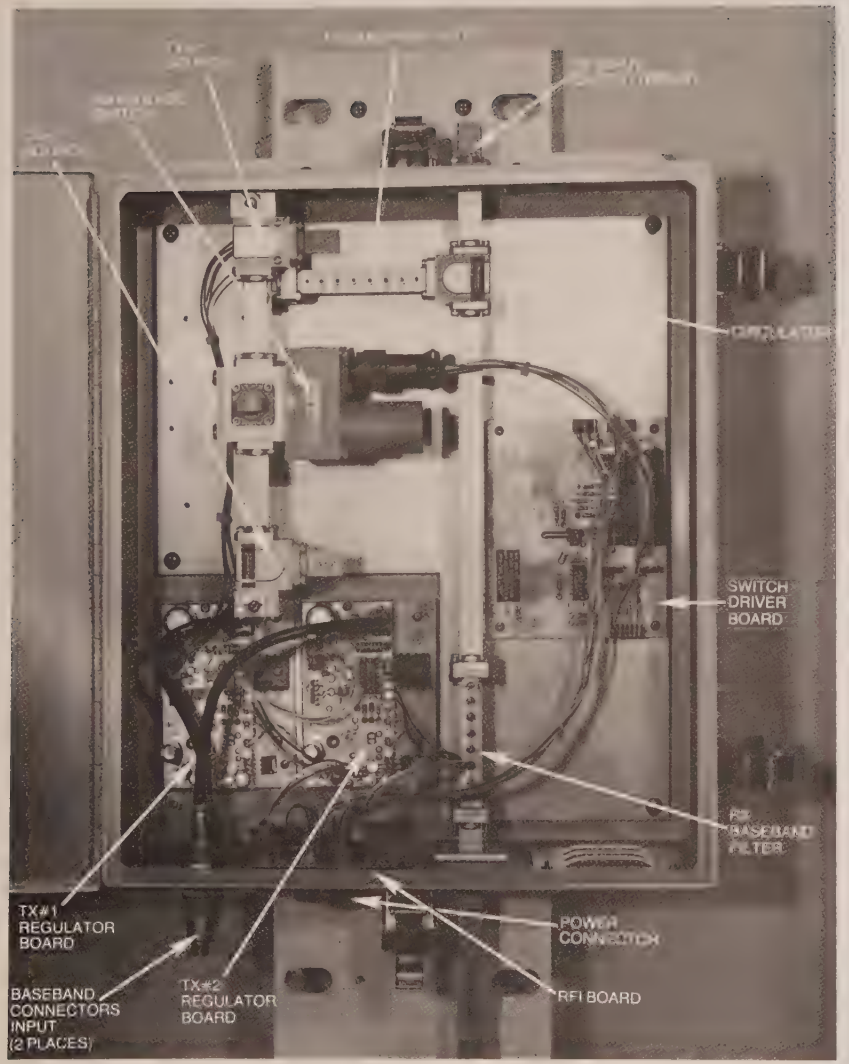


Figure 5-38. Hot Standby Duplex RF Assembly PN 842900A



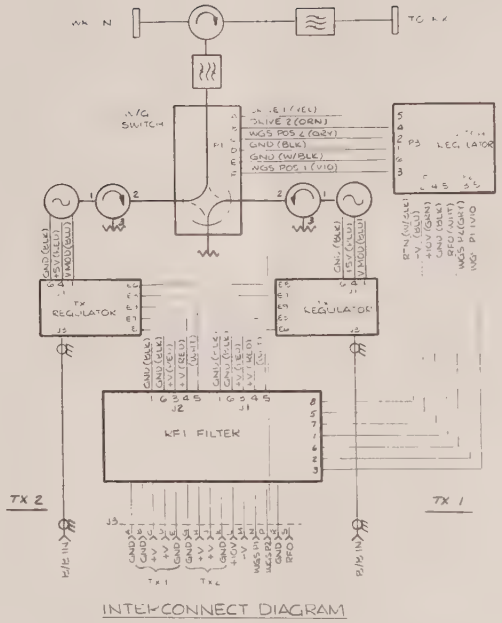


Figure 5-39. Transmitter Hot Standby RF Assembly
PN 842901-1

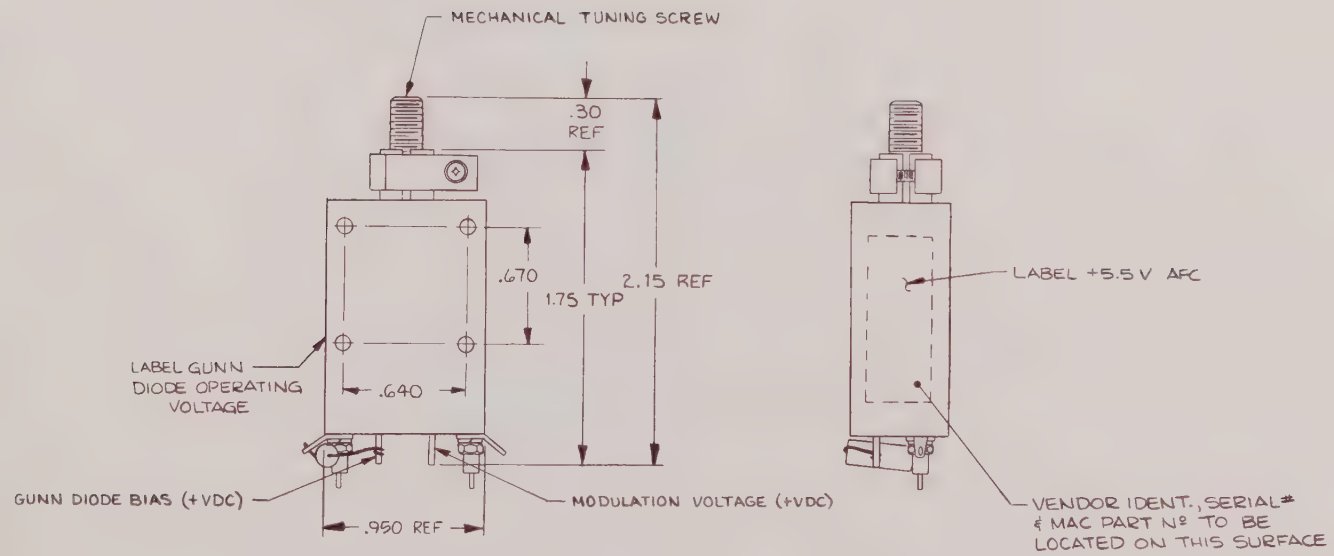
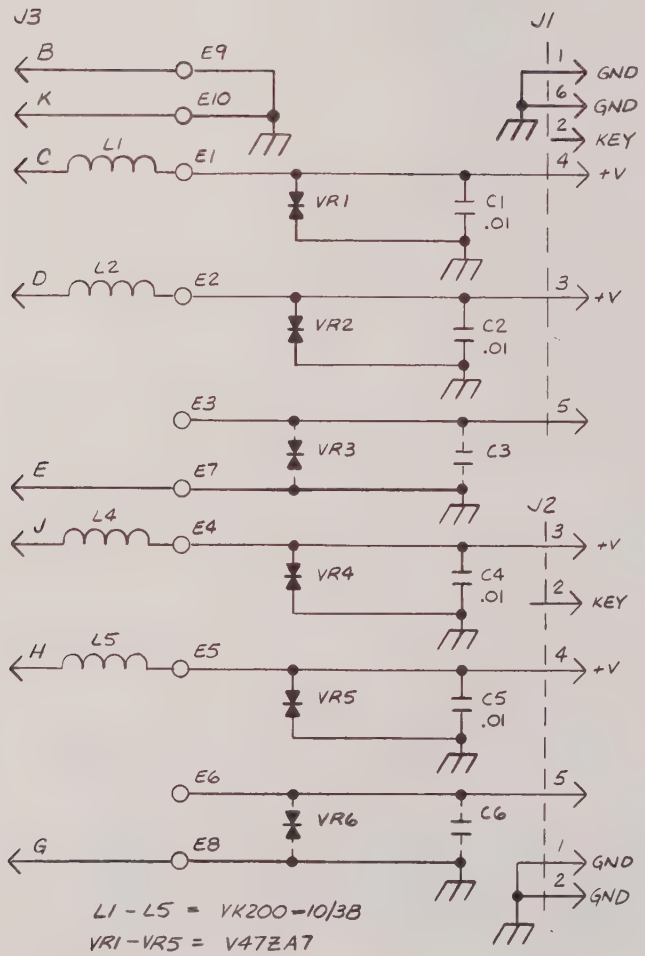


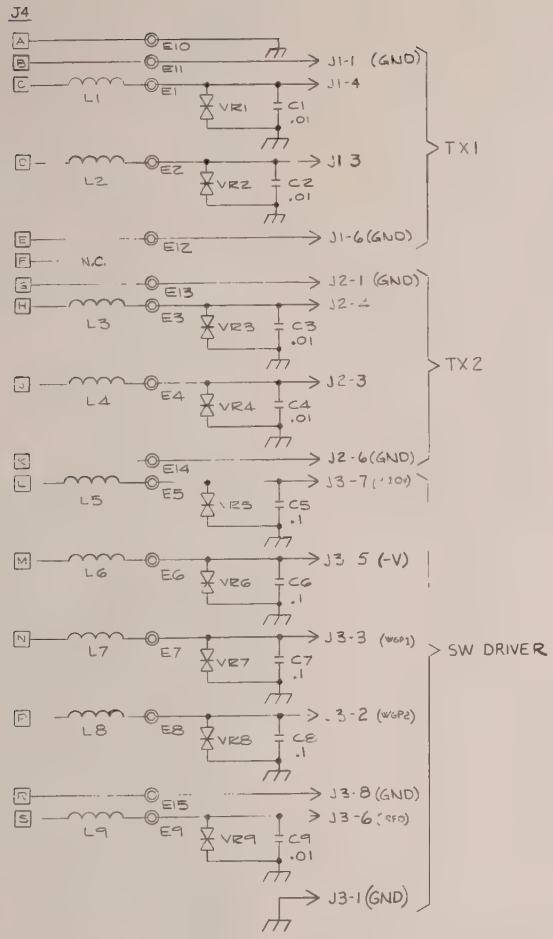
Figure 5-40. Transmitter Source PN 1840242J



NOTES :

1. J3 SHOWN FOR REFERENCE ONLY COMPONENTS WILL BE SOLDERED AT NEXT ASSY LEVEL.
2. REMOVE PIN 2 FROM J1 & J2 FOR KEYING.

Figure 5-41. Input RFI Filter – Schematic Diagram PN 843411-1



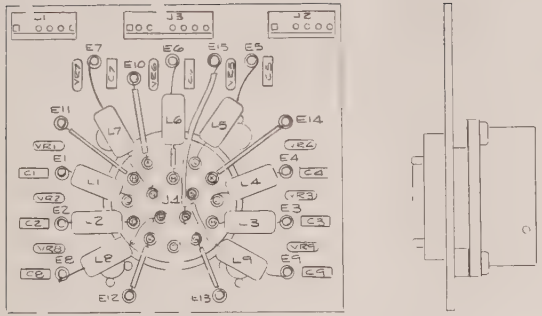
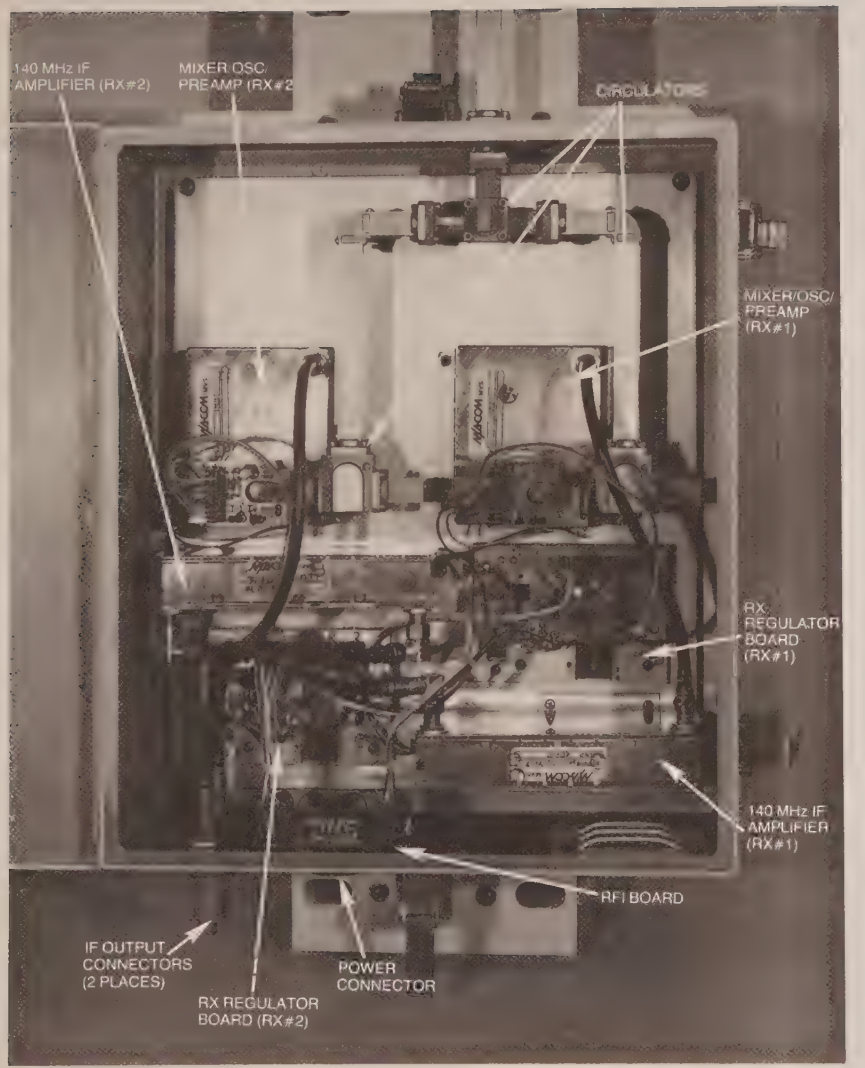
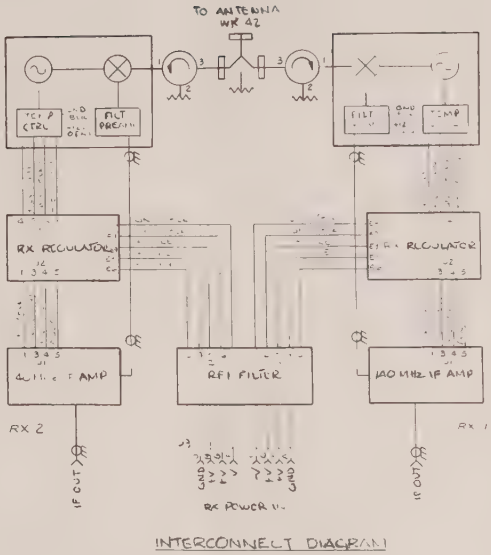


Figure 5-42. RFI Board – Component Locations/ Schematic Diagram PN 843806





INTERCONNECT DIAGRAM

Figure 5-43. Receiver Hot Standby RF Assembly PN 842902-1

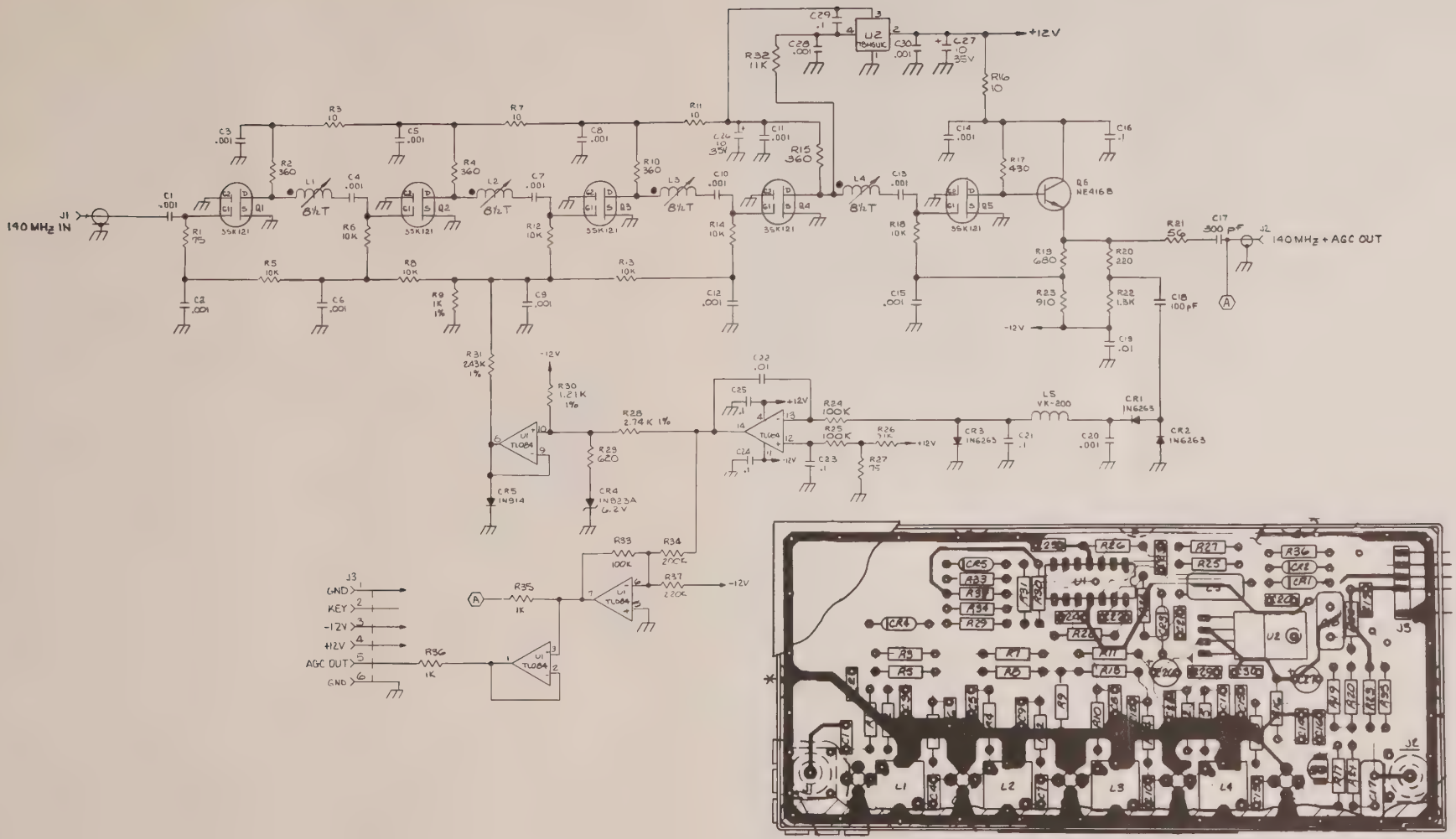
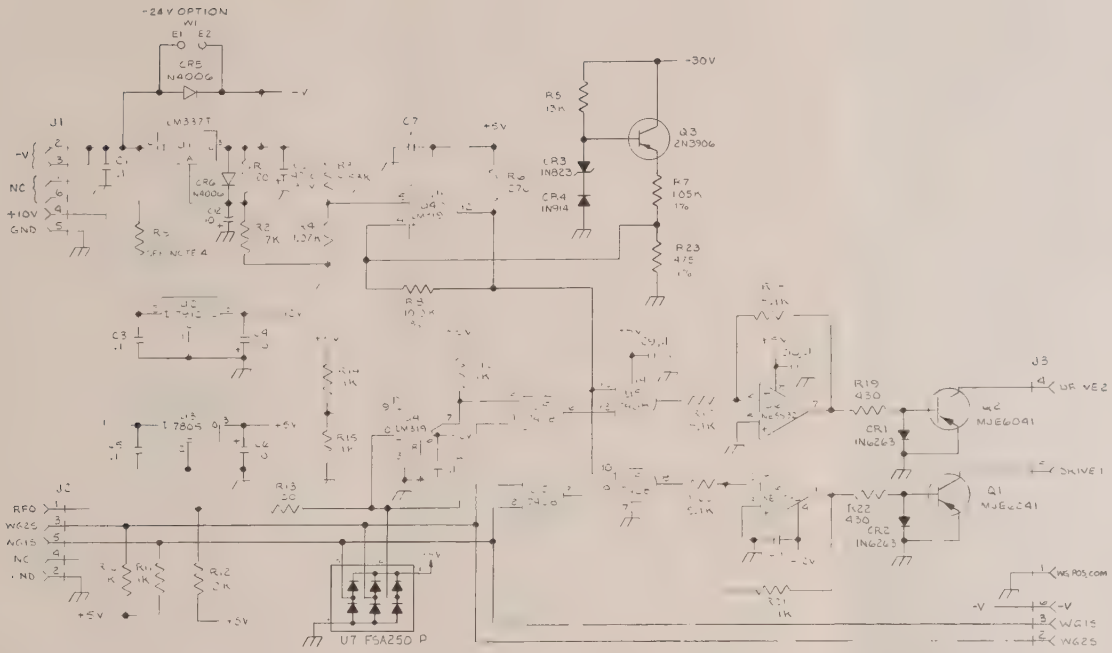


Figure 5-44. 140 MHz IF Amplifier – Component Locations/Schematic Diagram PN 1841930-1E



NOTES:
UNLESS OTHERWISE SPECIFIED:
1. RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
2. CAPACITOR VALUES ARE IN MICROFARADS.
3. 1% RESISTORS ARE 1/8W.
4. R9 WILL BE 680Ω, 2W IN THE -48V VERSION AND 270Ω, 1/2W IN THE -24V OPTION, WHERE U1 IS NOT USED

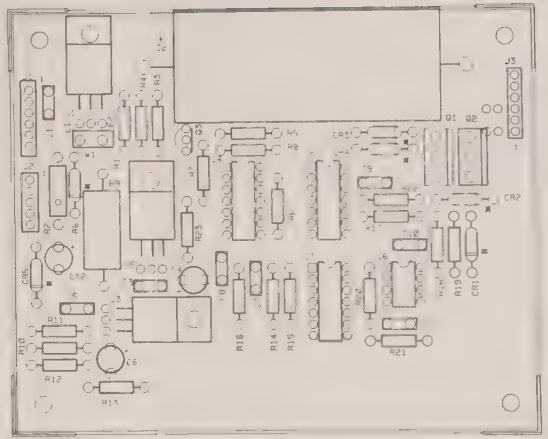


Figure 5-45. Negative Switch Driver – Component Locations Schematic Diagram PN 842907A

Figure 5-46. Power Supply Interconnect – Wiring Harness PN 1841574

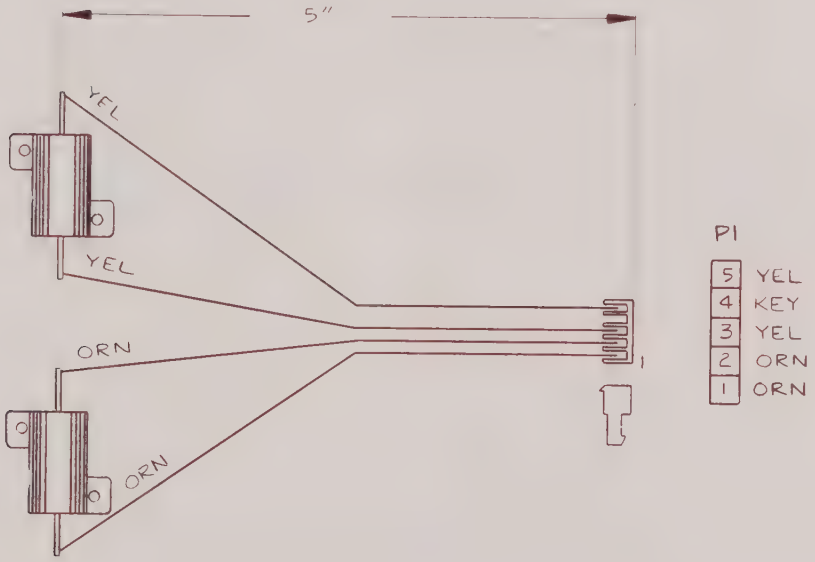
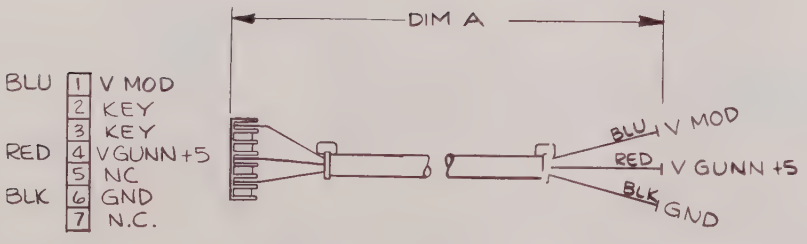


Figure 5-47. DC/DC Converter – Wiring Harness PN 843755A



GROUP	DIM A
- 1	8.00 ± .25
- 2	12.00 ± .25

Figure 5-48. RF Box – Wiring Harness PN 1841847-1B

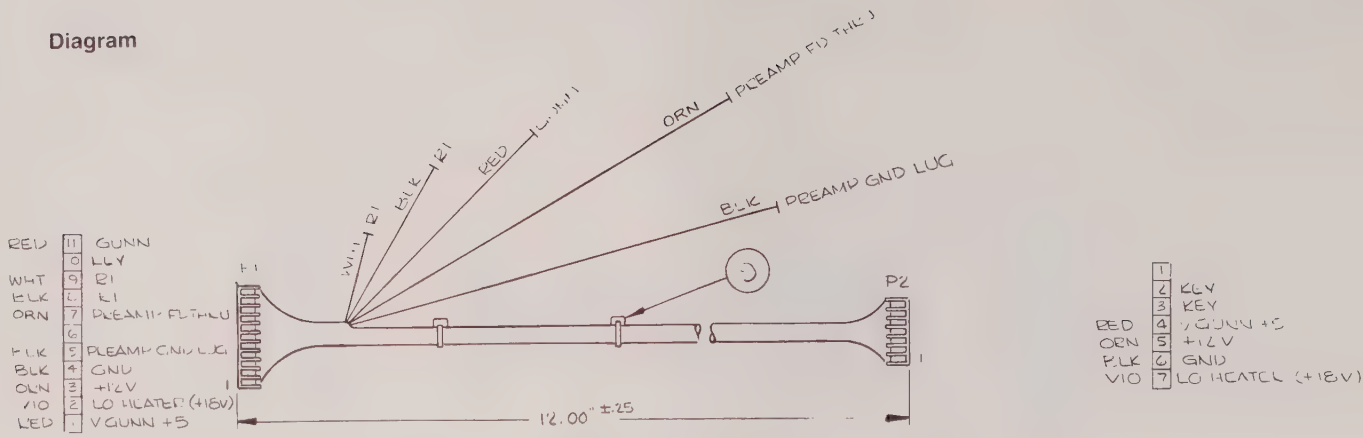


Figure 5-49. Mixer/Oscillator – Wiring Harness PN 842869-1B

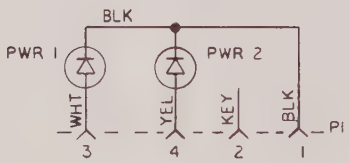


Figure 5-50. LED – Wiring Harness PN 843333-1A

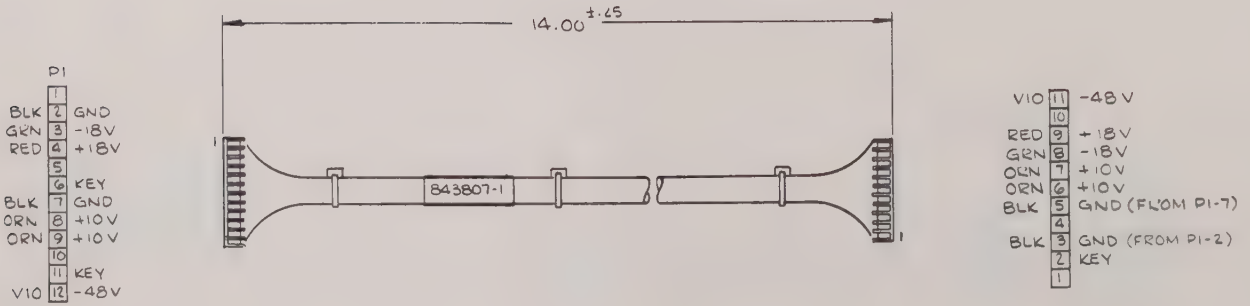


Figure 5-51. DC Power Supply – Wiring Harness PN 843807-1A

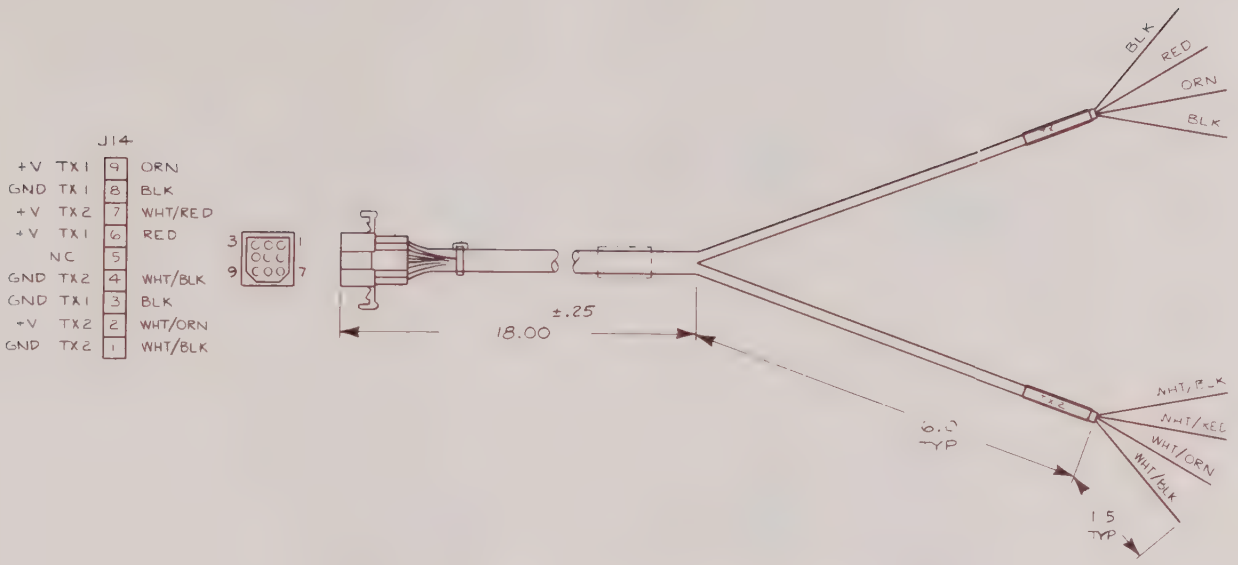


Figure 5-52. TX Power – Wiring Harness PN 843436-1A

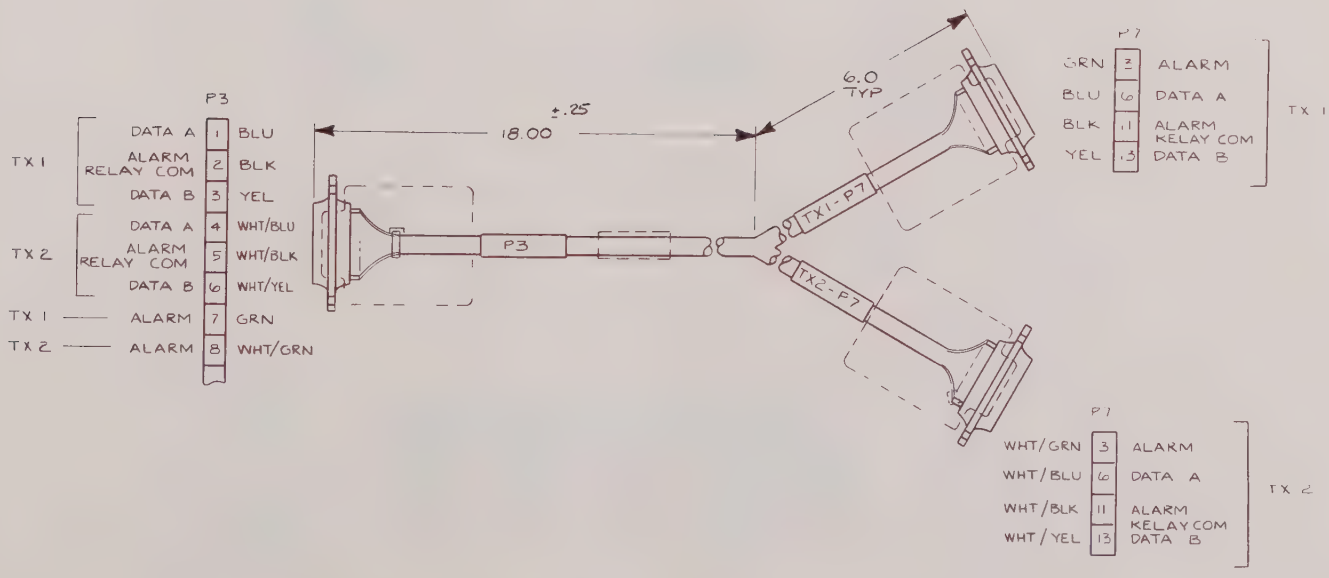


Figure 5-53. TX Data and Alarm – Wiring Harness PN 843442-1A

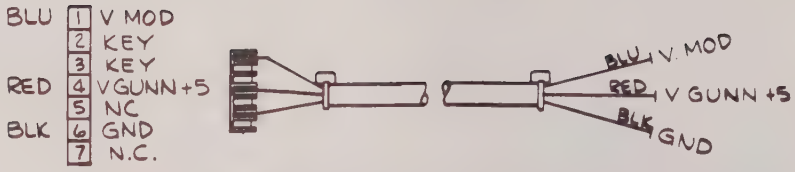


Figure 5-25. Transmitter Wiring Harness Assembly PN 1841847

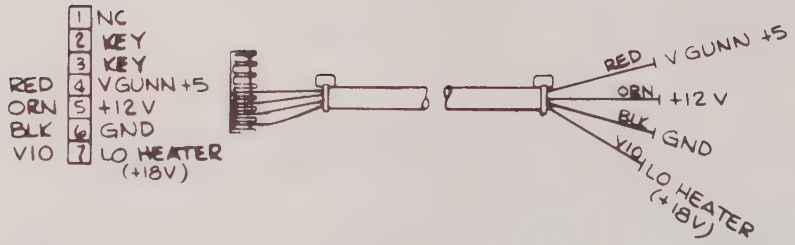


Figure 5-26. Receiver Wiring Harness Assembly PN 1841850

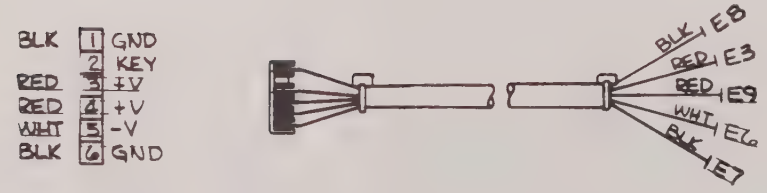


Figure 5-27. Power Wiring Harness Assembly PN 1841722

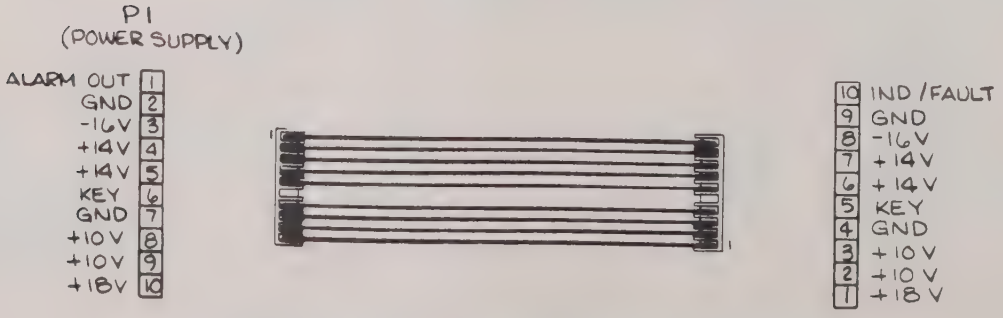


Figure 5-56. Transmitter RF Box – Wiring Harness PN 1841847-1B

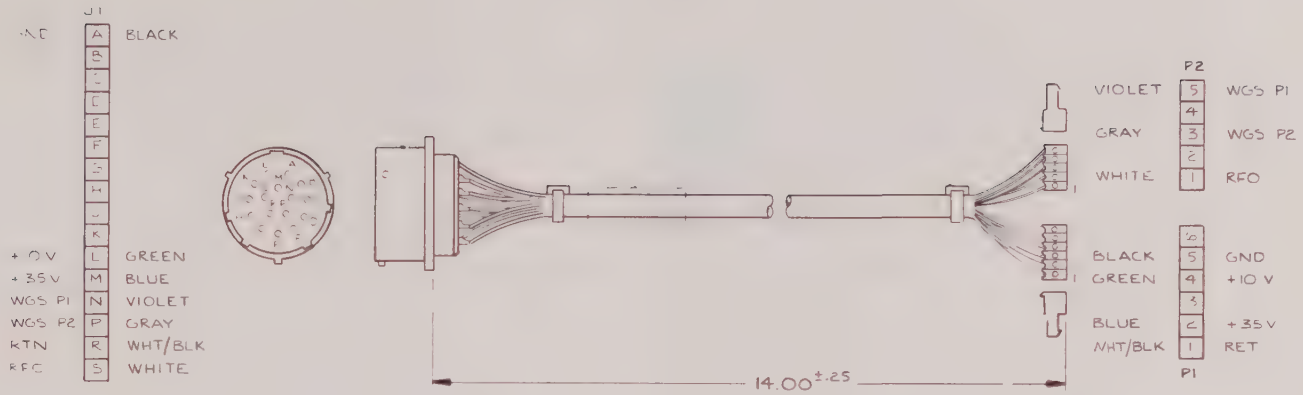


Figure 5-57. Hot Standby RF Head – Wiring Harness PN 842916-1

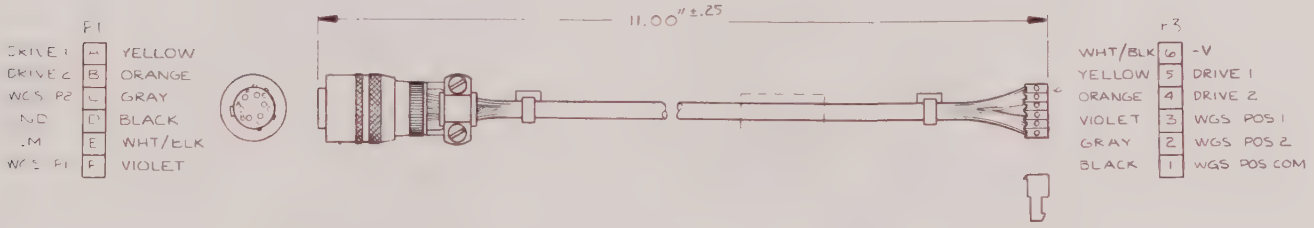


Figure 5-58. Waveguide Switch – Wiring Harness PN 842919-1B

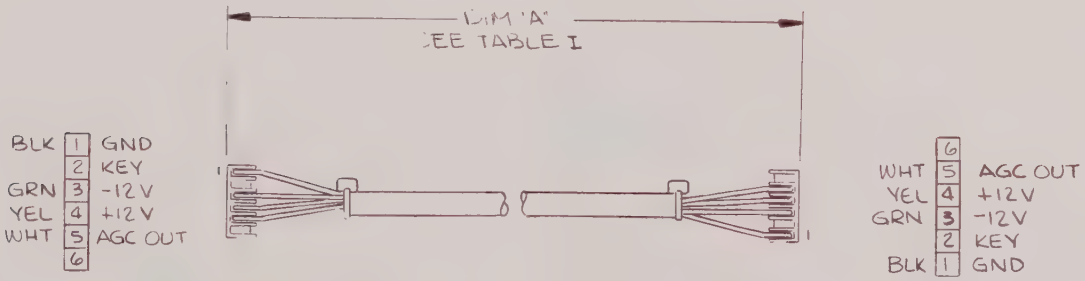


TABLE I

GROUP	DIM A	TOL
-1	5.00	±.25
-2	15.00	±.50
-3	8.00	±.25

Figure 5-59. IF Amplifier – Wiring Harness PN 1841879-1

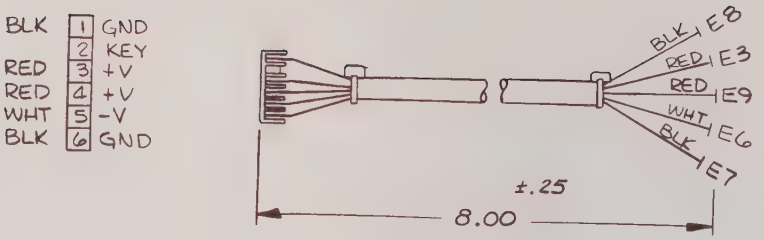


Figure 5-60. Power – Wiring Harness PN 841722-1

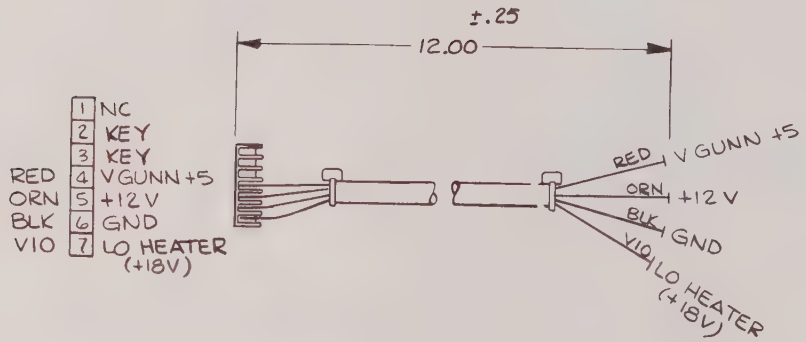


Figure 5-61. Receiver – Wiring Harness PN 841850A

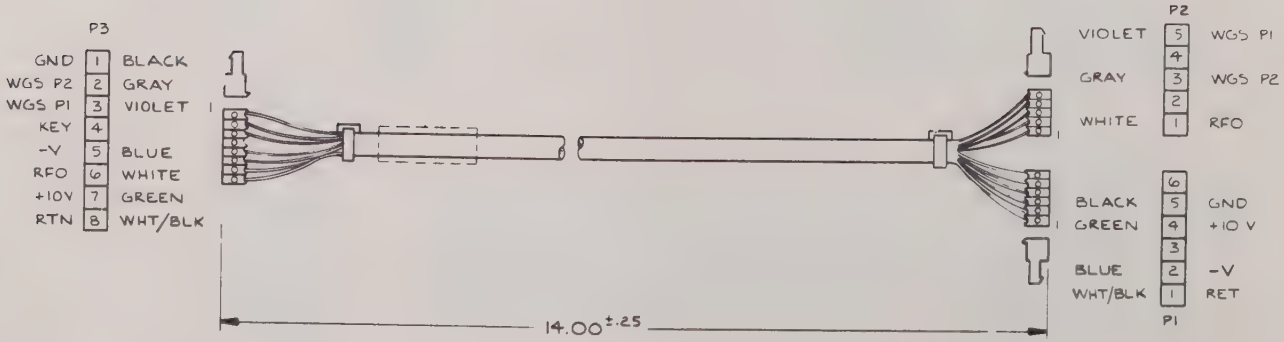
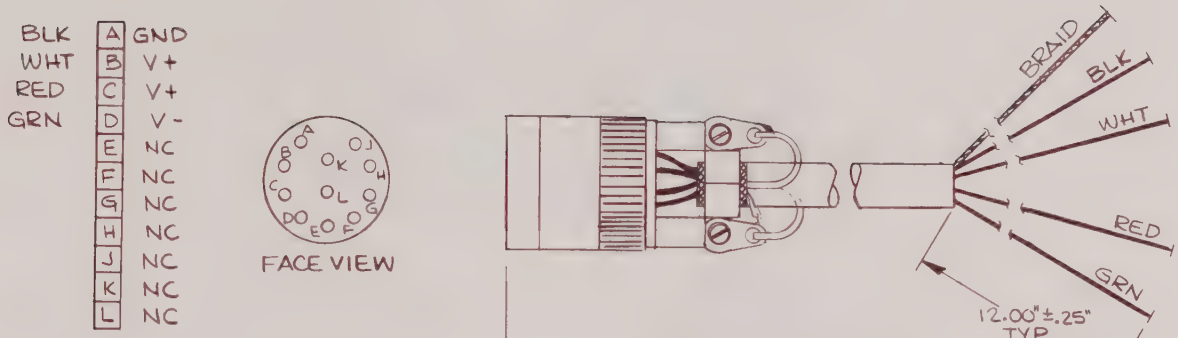


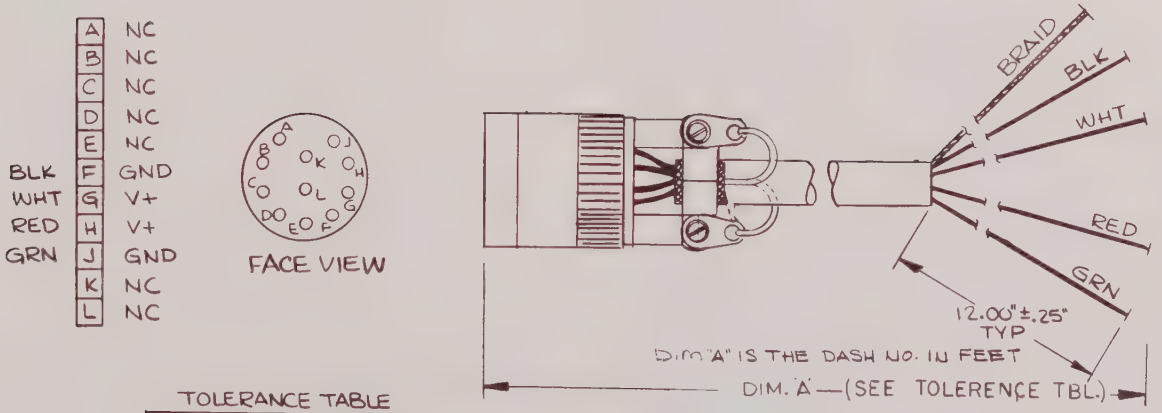
Figure 5-62. Hot Standby RF Head – Wiring Harness PN 843816B



TOLERANCE TABLE

DIM A	TOLERANCE
UP TO 12'	±.25'
12.1' TO 24'	±.50'
24.1' TO 48'	±1.0'
48.1' TO 120'	±3.0'
OVER 120'	±6.0'

Figure 5-63. Power Cable – Simplex Receiver PN 841932B



TOLERANCE TABLE

DIM A	TOLERANCE
UP TO 12'	±.25'
12.1' TO 24'	±.50'
24.1' TO 48'	±1.0'
48.1' TO 120'	±3.0'
OVER 120'	±6.0'

Figure 5-64. Power Cable – Simplex Transmitter PN 842030B

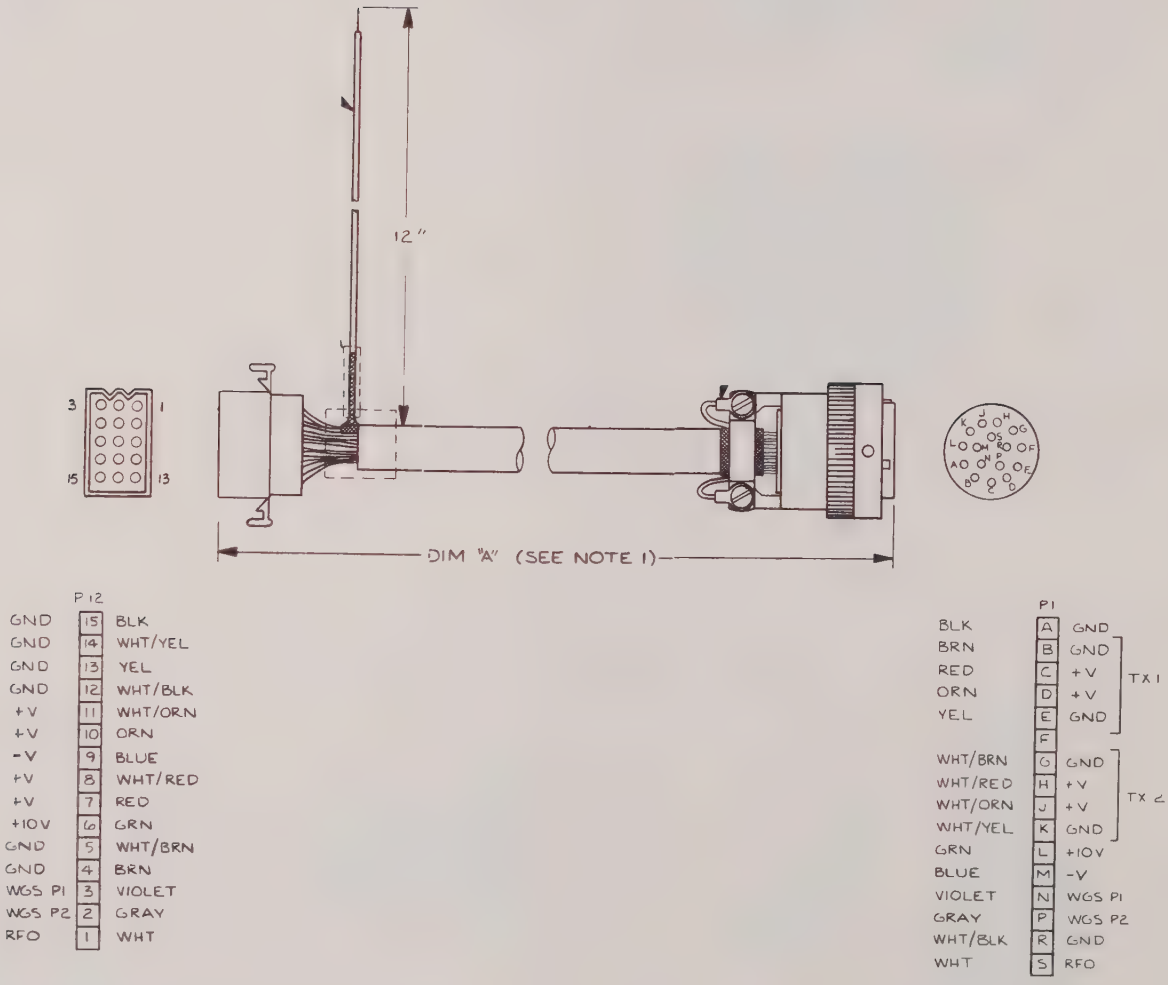


Figure 5-65. Power Cable – Hot Standby PN 843343B

SECTION 6
PARTS LISTS

1. Transmitter Assembly PN 1841558 6-2
2. Transmitter Baseband Board PWB Assembly PN 1841556-1 6-3
3. Transmitter Baseband Board PWB Assembly PN 1841556-2 6-8
4. Transmitter Baseband Board PWB Assembly PN 1841556-3 6-13
5. Transmitter Baseband Board PWB Assembly PN 1841556-4 6-18
6. Transmitter Baseband Board PWB Assembly PN 1841556-5 6-23
7. Line Equalizer PWB Assembly PN 1841568-1 6-28
8. Line Equalizer PWB Assembly PN 1841568-2 6-29
9. Line Equalizer PWB Assembly PN 1841568-3 6-30
10. Line Equalizer PWB Assembly PN 1841568-4 6-31
11. Line Equalizer PWB Assembly PN 1841568-5 6-32
12. Cable Simulator PWB Assembly PN 1842711 6-33
13. Line Equalizer PWB Assembly PN 1841973 6-34
14. Meter Assembly PN 1841749-1 6-35
15. Transmitter Power Supply Assembly PN 1841570-2 6-36
16. Transmitter Power Supply PWB Assembly PN 1841554-2 6-37
17. DC/DC Converter Assembly PN 843490-2 6-39
18. DC/DC Converter Assembly PWB Assembly PN 843492-1 6-40
19. Receiver Assembly PN 1841560-1 6-42
20. Receiver Baseband Board PWB Assembly PN 1841562-1 6-43
21. Receiver Baseband Board PWB Assembly PN 1841562-2 6-54
22. Receiver Baseband Board PWB Assembly PN 1841562-3 6-65
23. Receiver Baseband Board PWB Assembly PN 1841562-4 6-76
24. Receiver Baseband Board PWB Assembly PN 1841562-5 6-87
25. 40 MHz IF Filter PWB Assembly PN 1841578-1 .. 6-98
26. 40 MHz IF Filter PWB Assembly PN 1841578-2 .. 6-99
27. 40 MHz IF Filter PWB Assembly PN 1841578-3 . 6-100
28. 40 MHz IF Filter PWB Assembly PN 1841578-4 . 6-101
29. 40 MHz IF Filter PWB Assembly PN 1841578-5 . 6-102
30. Receiver Power Supply Assembly PN 1841570-1 6-103
31. Receiver Power Supply PWB Assembly PN 1841554-1 6-104
32. DC/DC Converter Assembly PN 843490-1 6-105
33. DC/DC Converter PWB Assembly PN 843512-1 6-106
34. RF Box Assembly (Duplex) PN 1841478-1 6-108
35. RF Box Assembly (TX Simplex) PN 1841478-2 . 6-109
36. RF Box Assembly (RX Simplex) PN 1841478-3 . 6-110
37. Transmitter Voltage Regulator Board PN 1841788-2 6-111
38. Receiver Voltage Regulator Board PN 1841788-1 6-112
39. RFI Board PWB Assembly PN 1841720-1 6-113
40. Mixer/Oscillator/Preamplifier Assembly PN 842870-1 6-114
41. 140 MHz IF Amplifier PWB Assembly PN 843901-1 6-115
42. 140 MHz Filter/Preamplifier PWB Assembly PN 1841936-1 6-117
43. Temperature Control PWB Assembly PN 1842744-1 6-119
44. Hot Standby Switch Assembly PN 842340-1 6-120
45. Display Board PWB Assembly PN 843330-1 6-121
46. Control Logic Board PWB Assembly PN 843334 6-122
47. Backplane PWB Assembly PN 843332-1 6-123
48. Hot Standby Switch Assembly PN 842340-2 6-125
49. AC Power Supply Assembly PN 842640 6-126
50. AC Power Supply PWB Assembly PN 842642 .. 6-127
51. Hot Standby Duplex RF Assembly PN 842900 .. 6-128
52. Hot Standby RF Box Assembly PN 842901 6-129
53. RFI Board PWB Assembly PN 843411 6-130
54. Hot Standby RF Box Assembly PN 842902 6-131
55. RFI Board PWB Assembly PN 1841720-2 6-132
56. 140 MHzIF Amplifier PWB Assembly PN 1841930-1 6-133
57. Negative Switch Driver PWB Assembly PN 842907 6-135
58. Power Supply Interconnect Wiring Harness Assembly PN 1841574 6-137
59. DC/DC Converter Wiring Harness Assembly PN 843755-2 6-138
60. Mixer/Oscillator Wiring Harness Assembly PN 842869-1 6-139
61. LED Wiring Harness Assembly PN 843333 6-140
62. DC Power Supply Wiring Harenss Assembly PN 843807 6-141
63. TX Power Wiring Harness Assembly PN 843442 6-142
64. TX Data and Alarm Wiring Harness Assembly PN 843442 6-143
65. RX Interconnect Wiring Harness Assembly PN 843431-1 6-144
66. RX Interconnect Wiring Harness Assembly PN 843431-2 6-145
67. Power Supply Interconnect Wiring Harness Assembly PN 843510 6-146
68. Hot Standby RF Head Wiring Harness Assembly PN 842916 6-147
69. Waveguide Switch Wiring Harness Assembly PN 842919 6-148
70. 140 MHz IF Amplifier Wire Harness Assembly PN 1841879-1 6-149
71. Power Wire Harness Assembly PN 1841722-1 6-150
72. Receiver Wire Harness Assembly PN 1841850-1 6-151
73. Hot Standby RF Head Wire Harness Assembly PN 843816 6-152
74. Receiver Simplex Power Cable PN 1841932-1 6-153
75. Transmitter Simplex Power Cable PN 1842030-1 6-154
76. Hot Standby Power Cable Assembly PN 843343 6-155
77. RFI Board PWB Assembly PN 843806-1 6-156

TRANSMITTER ASSEMBLY PN 1841558

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	Chassis Assembly	1841549-1	MAC
	Transmitter Baseband PWB Assembly	See Table 1	MAC
	Line Equalizer	See Table 2	MAC
	Power Supply Assembly	See Table 3	MAC
	Scrambler PWB Assembly (Optional)	1841564-99	MAC
	Meter Assembly	1841749-1	MAC
	P/S Interconnect Wire Harness Assy	1841574-1	MAC
	Front Panel, Extrusion	1841551-1	MAC
	Cover	1841559-1	MAC
	Cover, Wrap-Around (used w/desk top option)	1841469-1	MAC
	Extrusion, Side Mount	1831572-1	MAC
	Front Panel End Cap (used w/desk top option)	1841468-1	MAC
	Bind Post	88500-39	MAC
	Meter Retainer	1841646-1	MAC

Table 1

DATA RATE	TX BASEBAND BOARD
T1	1841556-1
CEPT1	1841556-2
T1C	1841556-3
T2	1841556-4
CETP2	1841556-5

Table 2

DATA RATE / CABLE LENGTH	1.544 Mb/s T1	2.048 Mb/s CEPT1	3.152 Mb/s T1C	6.312 Mb/s T2	8.448 Mb/s CEPT2
0 Feet	842711-10	842711-20	842711-30	1841973-40	842711-50
250 Feet	1841973-11	1841973-21	1841973-31	1841973-41	1841973-51
500 Feet	1841973-12	1841973-22	1841973-32	1841973-42	1841973-52
750 Feet	1841973-13	1841973-23	1841973-33	1841973-43	1841973-53
1000 Feet	1841973-14	1841973-24	1841973-34	1841973-44	1841973-54

Table 3

	DESCRIPTION	PART NO.
AC Power	Power Supply Assembly Shield, AC Input Fuse, 1/2A Slo-Blo	1841570-2 1841799-1 188200-27
DC Power	DC/DC Converter Assembly	843490-2

TRANSMITTER BASEBAND BOARD PWB ASSEMBLY PN 1841556-1

CAPACITORS

All capacitors are in microfarads unless otherwise specified.

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C1	0.1, 63V	189010A-4	
C2	10, 35V	189719A-9	Hilton SWT35Z10
C3	0.1, 63V	189010A-4	
C4	10, 35V	189719A-9	Hilton SWT35Z10
C5	0.1, 63V	189010A-4	
C6	10, 35V	189719A-9	Hilton SWT35Z10
C7	0.1, 63V	189010A-4	
C8	10, 35V	189719A-9	Hilton SWT35Z10
C9,C10,C11,C12,C13	0.1, 63V	189010A-4	
C15	820 pF, 1%	18917A-4	CM05ED821J03
C16	390 pF, 1%	189017A-1	CM05ED391J03
C17	100 pF, 1%	189008A-80	CM05ED101J03
C19,C20	0.1, 63V	189010A-4	
C21	20 pF	189008A-5	CM05ED200J03
C22	0.1, 63V	189010A-4	
C23	510 pF, 1%	189018A-7	CM05ED511J03
C24	56 pF, 1%	189008A-67	CM05ED560J03
C25	240 pF, 1%	189018A-16	CM05ED241J03
C26	56 pF, 1%	189008A-67	CM05ED560J03
C28	0.1, 63V	189010A-4	
C31,C32	10, 35V	189719A-9	Hilton SWT35Z10
C33	0.1, 63V	189010A-4	
C34	5 pF	189078A	CM05ED050J03
C35	3 pF	189079A	CM05ED030J03
C36,C37,C38,C39	0.1, 63V	189010A-4	
C40	100 pF	189086A	CM05ED101J03
C41,C42	0.1, 63V	189010A-4	
C43	100 pF	189086A	CM05ED101J03
C45,C46,C47,C48	0.1, 63V	189010A-4	
C49	0.001	189010A-1	
C50,C51	0.1, 63V	189010A-4	
C52	20 pF	189008A-5	CM05ED200J03
C53	0.1, 63V	189010A-4	
C54	0.01	189010A-2	
C55,C56	0.001	189010A-1	
C57	0.01	189010A-2	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C58,C59	0.1, 63V	189010A-4	
C60,C61	0.01	189010A-2	
C62	1	189010A-5	
C63,C64	0.1, 63V	189010A-4	
C65,C66,C67	10, 35V	189719A-9	Hilton SWT35Z10
C68	1	189010A-5	
C69	0.1, 63V	189010A-4	
	DIODES		
CR1,CR2,CR3,CR4,CR5, CR6,CR7,CR8,CR10,CR11,CR12	1N914	189405A	GE
	LEDS		
DS1,DS2,DS3	Green	89904-45	R/A
	PINS		
E1,E2,E3,E4,E5,E6, E9,E10,E11,E12	Pin	188500-29	Berg 75401
	FUSES		
F1	2A, 3AG	188200-2	
	CONNECTORS		
J1,J2,J3	Pin	188500-29	Berg 75401
J4	F	189397-5	R/A
J5	Pin	188500-29	Berg 75401
J6	BNC F	188357-48	R/A 227161-1
J7	D	89397-20	R/A
	RELAYS		
K1	Relay	1879800-28	Aromat RSD-5V
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3,L4,L5	Inductor	189169-37	Ferroxcube VK200-10/3B
	TRANSISTORS		
Q1,Q2	2N3906	189727A	Motorola
Q3	PN4258	189888A-50	
Q4	U310	18723-75	Unitrode
Q5	PN4258	189888A-50	
Q6,Q7	2N3904	189700A	Motorola
Q8	U310	18723-75	Unitrode
Q9	PN4258	189888A-50	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
Q10,Q11	MPS918	189774A	
Q12	2N2219	187223-21	
Q13	2N2905	189728-12	
Q15	PN4258	189888A-50	
Q16	2N3906	189727A	Motorola
Q17	2N3904	189700A	Motorola
Q18	PN4258	189888A-50	
Q19,Q20,Q21,Q22,Q23, Q24,Q25	2N3906	189727A	Motorola

RESISTORS

All resistors are in 1/4W 5% ohms unless otherwise specified.

R1	8.45K, 0.12W, 1%	189318A	
R2	6.81K, 0.12W, 1%	189316A	
R3	7.87K, 0.12W, 1%	189317A	
R4	1.78K, 0.12W, 1%	189256A-95	
R5	150, 0.12W, 1%	189256A-10	
R6	10K, 0.12W, 1%	189326A	
R7	4.64K, 0.12W, 1%	189312A	
R8	3.32K, 0.12W, 1%	189482A-24	
R9	1.1K, 0.12W, 1%	189310A	
R10	110, 0.12W, 1%	189256A-57	
R11	2.74K, 0.12W, 1%	187464A	
R12	3.48K, 1%	189327A-91	
R13,R14,R15,R16	10K, 0.12W, 1%	189326A	
R17	1.82K, 0.12W, 1%	188541A-10	
R18	10K, 0.12W, 1%	189326A	
R19	34, 0.12W, 1%	188541A-9	
R20	10K, 0.12W, 1%	189326A	
R21	1.82K, 0.12W, 1%	188541A-10	
R22	249, 0.12W, 1%	188541A-11	
R23	75, 0.12W, 1%	187456A	
R24,R25	1K, 0.12W, 1%	187460A	
R26,R27,R28	2K	189488A	RC07GF201J
R29	1.1K, 0.12W, 1%	189310A	
R30	2K	189488A	RC07GF201J
R31	100, 0.12W, 1%	189459A	
R34,R35	49.9, 0.12W, 1%	188541A-12	
R36	1.1K, 0.12W, 1%	189310A	
R37	100, 0.12W, 1%	189459A	
R38,R39	10	189231A	RC07GF100J
R41	301, 0.12W, 1%	189327A-42	
R43	464, 0.12W, 1%	187461A	
R45	523, 0.12W, 1%	189327A-39	
R46	7.87K, 0.12W, 1%	189317A	
R47	1.27K, 0.12W, 1%	189256A-92	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R48	374, 0.12W, 1%	189327A-37	
R50,R52	523, 0.12W, 1%	189327A-39	
R53	49.9, 0.12W, 1%	188541A-12	
R54	374, 0.12W, 1%	189327A-37	
R55	1K, 0.12W, 1%	187460A	
R57	330	189481A-52	RC07GF331J
R58	2K	189488A	RC07GF201J
R59	100	189202A	RC07GF101J
R60,R61	1K	189220A	RC07GF101J
R62	100	189202A	RC07GF101J
R63	330	189481A-52	RC07GF331J
R64	360	189200A-11	RC07GF361J
R65	33	189478A	RC07GF330J
R66	2.7K	189181A	RC07GF272J
R67	33	189478A	RC07GF330J
R68	220	189233A	RC07GF221J
R69	Potentiometer 200	188453-87	Bourns 3339P-1-201
R70	62	189481A-18	RC07GF620J
R71	1.1K	189200A-27	RC07GF112J
R72	2K	189488A	RC07GF201J
R73	1.1K, 0.12W, 1%	189310A	
R74	110, 0.12W, 1%	189256A-57	
R75	75, 0.12W, 1%	187456A	
R76,R77	20	189477A	RC07GF200J
R78	1.62K	189256A-87	
R79	301, 0.12W, 1%	189327A-42	
R80	76.8K, 0.12W, 1%	189332A	
R81	301, 0.12W, 1%	189327A-42	
R82,R83	200	189484A	RC07GF201J
R86	150, 0.12W, 1%	189256A-10	
R87	200	189484A	RC07GF201J
R88	909, 0.12W, 1%	189253A-29	
R89	243, 0.12W, 1%	189256A-75	
R92	22K	189228A	RC07GF223J
R93	3.8K	189224A	RC07GF382J
R94	1K	189220A	RC07GF101J
R95	56	189232A	RC07GF560J
R96	0.1, 2W, 0.1%	188539-64	
R98,R99,R100,R101	5.1K	189491A	RC07GF512J
R102	2K	189488A	RC07GF201J
R103	5.1K	189491A	RC07GF512J
R104	249K, 1/8W, 1%	89256-80	RN55D249RF
R105	68.1K, 1/8W, 1%	187466	RN55D68R1F
R106	100K, 0.12W, 1%	189330A	
R107	510	189481A-19	RC07GF511J
R108	100K, 0.12W, 1%	189330A	
R109	510	189481A-19	RC07GF511J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R110	44.2K, 1/8W, 1%	89327-23	RN55D44R2F
R111	1.05K, 1/8W, 1%	89327-55	RN55D1R05F
R112	44.2K, 1/8W, 1%	89327-23	RN55D44R2F
R113	1.05K, 1/8W, 1%	89327-55	RN55D1R05F
R114	2K	189488A	RC07GF201J
R115	499, 0.12W, 1%	88541-68	
R116	620	189200A-10	RC07GF5621J
R117	33K	189230A	RC07GF333J
R118	27K	188078A	RC07GF273J
R119	1K, 0.12W, 1%	187460A	
R120	100	189202A	RC07GF101J
	TRANSFORMERS		
T1	Transformer Assembly	1841877-1	MAC
	TERMINAL BLOCKS		
TB1	Terminal Block	189892-25	
TB3	Terminal Block	189892-24	
	TESTPOINTS		
TP1,TP2,TP3,TP4,TP5,TP6	White	188500-19	
TP7	Black	188500-20	
	INTEGRATED CIRCUITS		
U1,U2	Voltage Regulator μA79MGU1C	189889-44	
U3,U4	Voltage Regulator μA78MGU1C	189889-81	
U5	LF353N	189889-95	
U6	NE521	189975-52	
U7	LM311N	189889-11	
U8	LF353N	189889-95	
U9	LM317T	189889-62	
U10	SD5000	189975-51	
U11	TL081CP	189889-84	
U12	LM317T	189975-24	
U13	NE521	189975-52	
	SHORTING PLUGS		
W1,W2,W4,W5	Shorting Plug	188500-23	
	VARISTORS		
VR1	Varistor	189195-1	GEV47-ZA7

TRANSMITTER BASEBAND BOARD PWB ASSEMBLY PN 1841556-2

CAPACITORS

All capacitors are in microfarads unless otherwise specified.

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C1	0.1, 63V	189010A-4	
C2	10, 35V	189719A-9	Hilton SWT35Z10
C3	0.1, 63V	189010A-4	
C4	10, 35V	189719A-9	Hilton SWT35Z10
C5	0.1, 63V	189010A-4	
C6	10, 35V	189719A-9	Hilton SWT35Z10
C7	0.1, 63V	189010A-4	
C8	10, 35V	189719A-9	Hilton SWT35Z10
C9,C10,C11,C12,C13	0.1, 63V	189010A-4	
C15	330 pF, 1%	189018A-6	CM05ED331J03
C16	560 pF, 1%	189017A-2	CM05ED561J03
C17	62 pF, 1%	189008A-71	CM05ED621J03
C18	12 pF	189085A	
C19,C20	0.1, 63V	189010A-4	
C21	20 pF	189008A-5	CM05ED200J03
C22	0.1, 63V	189010A-4	
C23	390 pF, 1%	189017A-1	CM05ED391J03
C24	36 pF, 1%	189009A-5	CM05ED360J03
C25	240 pF, 1%	189018A-16	CM05ED241J03
C26	43 pF, 1%	189009A-7	CM05ED430J03
C28	0.1, 63V	189010A-4	
C31,C32	10, 35V	189719A-9	Hilton SWT35Z10
C33	0.1, 63V	189010A-4	
C34	5 pF	189078A	CM05ED050J03
C35	3 pF	189079A	CM05ED030J03
C36,C37,C38,C39	0.1, 63V	189010A-4	
C40	100 pF	189086A	CM05ED101J03
C41,C42	0.1, 63V	189010A-4	
C43	100 pF	189086A	CM05ED101J03
C45,C46,C47,C48	0.1, 63V	189010A-4	
C49	0.001	189010A-1	
C50,C51	0.1, 63V	189010A-4	
C52	20 pF	189008A-5	CM05ED200J03
C53	0.1, 63V	189010A-4	
C54	0.01	189010A-2	
C55,C56	0.001	189010A-1	
C57	0.01	189010A-2	
C58,C59	0.1, 63V	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C60,C61	0.01	189010A-2	
C62	1	189010A-5	
C63,C64	0.1, 63V	189010A-4	
C65,C66,C67	10, 35V	189719A-9	Hilton SWT35Z10
C68	1	189010A-5	
C69	0.1, 63V	189010A-4	
	DIODES		
CR1,CR2,CR3,CR4,CR5, CR6,CR7,CR8,CR10,CR11,CR12	1N914	189405A	GE
	LEDS		
DS1,DS2,DS3	Green	89904-45	R/A
	PINS		
E1,E2,E3,E4,E5,E6, E9,E10,E11,E12	Pin	188500-29	Berg 75401
	FUSES		
F1	2A, 3AG	188200-2	
	CONNECTORS		
J1,J2,J3	Pin	188500-29	Berg 75401
J4	F	189397-5	R/A
J5	Pin	188500-29	Berg 75401
J6	BNC F	188357-48	R/A 227161-1
J7	D	89397-20	R/A
	RELAYS		
K1	Relay	1879800-28	Aromat RSD-5V
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3,L4,L5	Inductor	189169-37	Ferroxcube VK200-10/3B
	TRANSISTORS		
Q1,Q2	2N3906	189727A	Motorola
Q3	PN4258	189888A-50	
Q4	U310	18723-75	Unitrode
Q5	PN4258	189888A-50	
Q6,Q7	2N3904	189700A	Motorola
Q8	U310	18723-75	Unitrode
Q9	PN4258	189888A-50	
Q10,Q11	MPS918	189774A	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
Q12	2N2219	187223-21	
Q13	2N2905	189728-12	
Q15	PN4258	189888A-50	
Q16	2N3906	189727A	Motorola
Q17	2N3904	189700A	Motorola
Q18	PN4258	189888A-50	
Q19,Q20,Q21,Q22,Q23, Q24,Q25	2N3906	189727A	Motorola

RESISTORS

All resistors are in 1/4W 5% ohms unless otherwise specified.

R1	8.45K, 0.12W, 1%	189318A	
R2	6.81K, 0.12W, 1%	189316A	
R3	7.87K, 0.12W, 1%	189317A	
R4	1.78K, 0.12W, 1%	189256A-95	
R5	150, 0.12W, 1%	189256A-10	
R6	10K, 0.12W, 1%	189326A	
R7	4.64K, 0.12W, 1%	189312A	
R8	3.32K, 0.12W, 1%	189482A-24	
R9	1.1K, 0.12W, 1%	189310A	
R10	110, 0.12W, 1%	189256A-57	
R11	2.74K, 0.12W, 1%	187464A	
R12	3.48K, 1%	189327A-91	
R13,R14,R15,R16	10K, 0.12W, 1%	189326A	
R17	1.82K, 0.12W, 1%	188541A-10	
R18	10K, 0.12W, 1%	189326A	
R19	41.2, 0.12W, 1%	188541A-16	
R20	10K, 0.12W, 1%	189326A	
R21	1.82K, 0.12W, 1%	188541A-10	
R22	90.0, 1%	187458A	
R23	75, 0.12W, 1%	187456A	
R24,R25	1K, 0.12W, 1%	187460A	
R26,R27,R28	2K	189488A	RC07GF201J
R29	1.1K, 0.12W, 1%	189310A	
R30	2K	189488A	RC07GF201J
R31	100, 0.12W, 1%	189459A	
R34,R35	49.9, 0.12W, 1%	188541A-12	
R36	1.1K, 0.12W, 1%	189310A	
R37	100, 0.12W, 1%	189459A	
R38 R39	10	189231A	RC07GF100J
R41	301, 0.12W, 1%	189327A-42	
R43	464, 0.12W, 1%	187461A	
R45	523, 0.12W, 1%	189327A-39	
R46	7.87K, 0.12W, 1%	189317A	
R47	1.27K, 0.12W, 1%	189256A-92	
R48	374, 0.12W, 1%	189327A-37	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R50,R52	523, 0.12W, 1%	189327A-39	
R53	49.9, 0.12W, 1%	188541A-12	
R54	374, 0.12W, 1%	189327A-37	
R55	1K, 0.12W, 1%	187460A	
R57	330	189481A-52	RC07GF331J
R58	2K	189488A	RC07GF201J
R59	100	189202A	RC07GF101J
R60,R61	1K	189220A	RC07GF101J
R62	100	189202A	RC07GF101J
R63	330	189481A-52	RC07GF331J
R64	360	189200A-11	RC07GF361J
R65	33	189478A	RC07GF330J
R66	2.7K	189181A	RC07GF272J
R67	33	189478A	RC07GF330J
R68	220	189233A	RC07GF221J
R69	Potentiometer 200	188453-87	Bourns 3339P-1-201
R70	62	189481A-18	RC07GF620J
R71	1.1K	189200A-27	RC07GF112J
R72	2K	189488A	RC07GF201J
R73	1.1K, 0.12W, 1%	189310A	
R74	110, 0.12W, 1%	189256A-57	
R75	75, 0.12W, 1%	187456A	
R76,R77	20	189477A	RC07GF200J
R78	2.15K	189337A	
R79	301, 0.12W, 1%	189327A-42	
R80	76.8K, 0.12W, 1%	189332A	
R81	301, 0.12W, 1%	189327A-42	
R82,R83	200	189484A	RC07GF201J
R86	150, 0.12W, 1%	189256A-10	
R87	200	189484A	RC07GF201J
R88	909, 0.12W, 1%	189253A-29	
R89	243, 0.12W, 1%	189256A-75	
R92	22K	189228A	RC07GF223J
R93	3.8K	189224A	RC07GF382J
R94	1K	189220A	RC07GF101J
R95	56	189232A	RC07GF560J
R96	0.1, 2W, 0.1%	188539-64	
R98,R99,R100,R101	5.1K	189491A	RC07GF512J
R102	2K	189488A	RC07GF201J
R103	5.1K	189491A	RC07GF512J
R104	249K, 1/8W, 1%	89256-80	RN55D249RF
R105	68.1K, 1/8W, 1%	187466	RN55D68R1F
R106	100K, 0.12W, 1%	189330A	
R107	510	189481A-19	RC07GF511J
R108	100K, 0.12W, 1%	189330A	
R109	510	189481A-19	RC07GF511J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R110	36.5K, 1/8W, 1%	189256A-4	RN55D36R5F
R112	36.5K, 1/8W, 1%	189256A-4	RN55D36R5F
R114	2K	189488A	RC07GF201J
R115	499, 0.12W, 1%	88541-68	
R116	620	189200A-10	RC07GF5621J
R117	33K	189230A	RC07GF333J
R118	27K	188078A	RC07GF273J
R119	1K, 0.12W, 1%	187460A	
R120	100	189202A	RC07GF101J
	TRANSFORMERS		
T1	Transformer Assembly	1841877-1	MAC
	TERMINAL BLOCKS		
TB1	Terminal Block	189892-25	
TB3	Terminal Block	189892-24	
	TESTPOINTS		
TP1,TP2,TP3,TP4,TP5,TP6	White	188500-19	
TP7	Black	188500-20	
	INTEGRATED CIRCUITS		
U1,U2	Voltage Regulator μA79MGU1C	189889-44	
U3,U4	Voltage Regulator μA78MGU1C	189889-81	
U5	LF353N	189889-95	
U6	NE521	189975-52	
U7	LM311N	189889-11	
U8	LF353N	189889-95	
U9	LM317T	189889-62	
U10	SD5000	189975-51	
U11	TL081CP	189889-84	
U12	LM317T	189975-24	
U13	NE521	189975-52	
	SHORTING PLUGS		
W1,W2,W4,W5	Shorting Plug	188500-23	
	VARISTORS		
VR1	Varistor	189195-1	GEV47-ZA7

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
TRANSMITTER BASEBAND BOARD PWB ASSEMBLY PN 1841556-3			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1	0.1, 63V	189010A-4	
C2	10, 35V	189719A-9	Hilton SWT35Z10
C3	0.1, 63V	189010A-4	
C4	10, 35V	189719A-9	Hilton SWT35Z10
C5	0.1, 63V	189010A-4	
C6	10, 35V	189719A-9	Hilton SWT35Z10
C7	0.1, 63V	189010A-4	
C8	10, 35V	189719A-9	Hilton SWT35Z10
C9,C10,C11,C12,C13	0.1, 63V	189010A-4	
C15	430 pF, 1%	189018A-18	CM05ED431J03
C16	120 pF, 1%	189008A-10	CM05ED121J03
C17	30 pF, 1%	189009A-3	CM05ED300J03
C18	12 pF	189085A	CM05ED120J03
C19,C20	0.1, 63V	189010A-4	
C21	20 pF	189008A-5	CM05ED200J03
C22	0.1, 63V	189010A-4	
C23	240 pF, 1%	189018A-16	CM05ED241J03
C24	36 pF, 1%	189009A-5	CM05ED360J03
C25	100 pF, 1%	189008A-80	CM05ED101J03
C26	82 pF, 1%	189008A-72	CM05ED820J03
C28	0.1, 63V	189010A-4	
C31,C32	10, 35V	189719A-9	Hilton SWT35Z10
C33	0.1, 63V	189010A-4	
C34	5 pF	189078A	CM05ED050J03
C35	1 pF	189017A-13	CM05ED010J03
C36,C37,C38,C39	0.1, 63V	189010A-4	
C40	100 pF	189086A	CM05ED101J03
C41,C42	0.1, 63V	189010A-4	
C43	100 pF	189086A	CM05ED101J03
C45,C46,C47,C48	0.1, 63V	189010A-4	
C49	0.001	189010A-1	
C50,C51	0.1, 63V	189010A-4	
C52	20 pF	189008A-5	CM05ED200J03
C53	0.1, 63V	189010A-4	
C54	0.01	189010A-2	
C55,C56	0.001	189010A-1	
C57	0.01	189010A-2	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C58,C59	0.1, 63V	189010A-4	
C60,C61	0.01	189010A-2	
C62	1	189010A-5	
C63,C64	0.1, 63V	189010A-4	
C65,C66,C67	10, 35V	189719A-9	Hilton SWT35Z10
C68	1	189010A-5	
C69	0.1, 63V	189010A-4	
	DIODES		
CR1,CR2,CR3,CR4,CR5, CR6,CR7,CR8,CR10,CR11,CR12	1N914	189405A	GE
	LEDS		
DS1,DS2,DS3	Green	89904-45	R/A
	PINS		
E1,E2,E3,E4,E5,E6, E9,E10,E11,E12	Pin	188500-29	Berg 75401
	FUSES		
F1	2A, 3AG	188200-2	
	CONNECTORS		
J1,J2,J3	Pin	188500-29	Berg 75401
J4	F	189397-5	R/A
J5	Pin	188500-29	Berg 75401
J6	BNC F	188357-48	R/A 227161-1
J7	D	89397-20	R/A
	RELAYS		
K1	Relay	1879800-28	Aromat RSD-5V
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3,L4,L5	Inductor	189169-37	Ferroxcube VK200-10/3B
	TRANSISTORS		
Q1,Q2	2N3906	189727A	Motorola
Q3	PN4258	189888A-50	
Q4	U310	18723-75	Unitrode
Q5	PN4258	189888A-50	
Q6,Q7	2N3904	189700A	Motorola
Q8	U310	18723-75	Unitrode
Q9	PN4258	189888A-50	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
Q10,Q11	MPS918	189774A	
Q12	2N2219	187223-21	
Q13	2N2905	189728-12	
Q15	PN4258	189888A-50	
Q16	2N3906	189727A	Motorola
Q17	2N3904	189700A	Motorola
Q18	PN4258	189888A-50	
Q19,Q20,Q21,Q22,Q23, Q24,Q25	2N3906	189727A	Motorola

RESISTORS

All resistors are in 1/4W 5% ohms unless otherwise specified.

R1	8.45K, 0.12W, 1%	189318A	
R2	6.81K, 0.12W, 1%	189316A	
R3	7.87K, 0.12W, 1%	189317A	
R4	1.78K, 0.12W, 1%	189256A-95	
R5	150, 0.12W, 1%	189256A-10	
R6	10K, 0.12W, 1%	189326A	
R7	4.64K, 0.12W, 1%	189312A	
R8	3.32K, 0.12W, 1%	189482A-24	
R9	1.1K, 0.12W, 1%	189310A	
R10	110, 0.12W, 1%	189256A-57	
R11	2.74K, 0.12W, 1%	187464A	
R12	3.48K, 1%	189327A-91	
R13,R14,R15,R16	10K, 0.12W, 1%	189326A	
R17	1.82K, 0.12W, 1%	188541A-10	
R18	10K, 0.12W, 1%	189326A	
R19	34, 0.12W, 1%	188541A-9	
R20	10K, 0.12W, 1%	189326A	
R21	1.82K, 0.12W, 1%	188541A-10	
R22	249, 0.12W, 1%	188541A-11	
R23	75, 0.12W, 1%	187456A	
R24,R25	1K, 0.12W, 1%	187460A	
R26,R27,R28	2K	189488A	RC07GF201J
R29	1.1K, 0.12W, 1%	189310A	
R30	2K	189488A	RC07GF201J
R31	100, 0.12W, 1%	189459A	
R34,R35	49.9, 0.12W, 1%	188541A-12	
R36	1.1K, 0.12W, 1%	189310A	
R37	100, 0.12W, 1%	189459A	
R38,R39	10	189231A	RC07GF100J
R41	301, 0.12W, 1%	189327A-42	
R43	523, 0.12W, 1%	189327A-39	
R45	523, 0.12W, 1%	189327A-39	
R46	7.87K, 0.12W, 1%	189317A	
R47	1.27K, 0.12W, 1%	189256A-92	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R48	374, 0.12W, 1%	189327A-37	
R50,R52	523, 0.12W, 1%	189327A-39	
R53	49.9, 0.12W, 1%	188541A-12	
R54	374, 0.12W, 1%	189327A-37	
R55	1K, 0.12W, 1%	187460A	
R57	330	189481A-52	RC07GF331J
R58	2K	189488A	RC07GF201J
R59	100	189202A	RC07GF101J
R60,R61	1K	189220A	RC07GF101J
R62	100	189202A	RC07GF101J
R63	330	189481A-52	RC07GF331J
R64	360	189200A-11	RC07GF361J
R65	33	189478A	RC07GF330J
R66	2.7K	189181A	RC07GF272J
R67	33	189478A	RC07GF330J
R68	220	189233A	RC07GF221J
R69	Potentiometer 200	188453-87	Bourns 3339P-1-201
R70	62	189481A-18	RC07GF620J
R71	1.1K	189200A-27	RC07GF112J
R72	2K	189488A	RC07GF201J
R73	1.1K, 0.12W, 1%	189310A	
R74	110, 0.12W, 1%	189256A-57	
R75	75, 0.12W, 1%	187456A	
R76,R77	20	189477A	RC07GF200J
R78	3.48K	189327A-91	
R79	301, 0.12W, 1%	189327A-42	
R80	76.8K, 0.12W, 1%	189332A	
R81	301, 0.12W, 1%	189327A-42	
R82,R83	200	189484A	RC07GF201J
R86	150, 0.12W, 1%	189256A-10	
R87	200	189484A	RC07GF201J
R88	909, 0.12W, 1%	189253A-29	
R89	243, 0.12W, 1%	189256A-75	
R92	22K	189228A	RC07GF223J
R93	3.8K	189224A	RC07GF382J
R94	1K	189220A	RC07GF101J
R95	56	189232A	RC07GF560J
R96	0.1, 2W, 0.1%	188539-64	
R98,R99,R100,R101	5.1K	189491A	RC07GF512J
R102	2K	189488A	RC07GF201J
R103	5.1K	189491A	RC07GF512J
R104	249K, 1/8W, 1%	89256-80	RN55D249RF
R105	68.1K, 1/8W, 1%	187466	RN55D68R1F
R106	100K, 0.12W, 1%	189330A	
R107	510	189481A-19	RC07GF511J
R108	100K, 0.12W, 1%	189330A	
R109	510	189481A-19	RC07GF511J
R110	23.7K, 1/8W, 1%	88277	RN55D23R7F

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R111	1.05K, 1/8W, 1%	89327-55	RN55D1R05F
R112	23.7K, 1/8W, 1%	88277	RN55D23R7F
R113	1.05K, 1/8W, 1%	89327-55	RN55D1R05F
R114	2K	189488A	RC07GF201J
R115	499, 0.12W, 1%	88541-68	
R116	620	189200A-10	RC07GF5621J
R117	33K	189230A	RC07GF333J
R118	27K	188078A	RC07GF273J
R119	1K, 0.12W, 1%	187460A	
R120	100	189202A	RC07GF101J
	TRANSFORMERS		
T1	Transformer Assembly	1841877-1	MAC
	TERMINAL BLOCKS		
TB1	Terminal Block	189892-25	
TB3	Terminal Block	189892-24	
	TESTPOINTS		
TP1,TP2,TP3,TP4,TP5,TP6	White	188500-19	
TP7	Black	188500-20	
	INTEGRATED CIRCUITS		
U1,U2	Voltage Regulator μA79MGU1C	189889-44	
U3,U4	Voltage Regulator μA78MGU1C	189889-81	
U5	LF353N	189889-95	
U6	NE521	189975-52	
U7	LM311N	189889-11	
U8	LF353N	189889-95	
U9	LM317T	189889-62	
U10	SD5000	189975-51	
U11	TL081CP	189889-84	
U12	LM317T	189975-24	
U13	NE521	189975-52	
	SHORTING PLUGS		
W1,W2,W4,W5	Shorting Plug	188500-23	
	VARISTORS		
VR1	Varistor	189195-1	GEV47-ZA7

TRANSMITTER BASEBAND BOARD PWB ASSEMBLY PN 1841556-4

CAPACITORS

All capacitors are in microfarads unless otherwise specified.

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C1	0.1, 63V	189010A-4	
C2	10, 35V	189719A-9	Hilton SWT35Z10
C3	0.1, 63V	189010A-4	
C4	10, 35V	189719A-9	Hilton SWT35Z10
C5	0.1, 63V	189010A-4	
C6	10, 35V	189719A-9	Hilton SWT35Z10
C7	0.1, 63V	189010A-4	
C8	10, 35V	189719A-9	Hilton SWT35Z10
C9,C10,C11,C12,C13	0.1, 63V	189010A-4	
C15	110 pF, 1%	189008A-81	CM05ED111J03
C16	240 pF, 1%	189018A-16	CM05ED241J03
C17	27 pF, 1%	189009A-2	CM05ED270J03
C19,C20	0.1, 63V	189010A-4	
C21	20 pF	189008A-5	CM05ED200J03
C22	0.1, 63V	189010A-4	
C23	100 pF, 1%	189008A-80	CM05ED101J03
C24	68 pF, 1%	189009A-9	CM05ED680J03
C25	27 pF, 1%	189009A-2	CM05ED270J03
C26	82 pF, 1%	189008A-72	CM05ED820J03
C28	0.1, 63V	189010A-4	
C30	5 pF	189078A	CM05ED050J03
C31,C32	10, 35V	189719A-9	Hilton SWT35Z10
C33	0.1, 63V	189010A-4	
C34	5 pF	189078A	CM05ED050J03
C35	1 pF	189017A-13	CM05ED010J03
C36,C37,C38,C39	0.1, 63V	189010A-4	
C40	100 pF	189086A	CM05ED101J03
C41,C42	0.1, 63V	189010A-4	
C43	100 pF	189086A	CM05ED101J03
C45,C46,C47,C48	0.1, 63V	189010A-4	
C49	0.001	189010A-1	
C50,C51	0.1, 63V	189010A-4	
C52	20 pF	189008A-5	CM05ED200J03
C53	0.1, 63V	189010A-4	
C54	0.01	189010A-2	
C55,C56	0.001	189010A-1	
C57	0.01	189010A-2	
C58,C59	0.1, 63V	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C60,C61	0.01	189010A-2	
C62	1	189010A-5	
C63,C64	0.1, 63V	189010A-4	
C65,C66,C67	10, 35V	189719A-9	Hilton SWT35Z10
C68	1	189010A-5	
C69	0.1, 63V	189010A-4	
	DIODES		
CR1,CR2,CR3,CR4,CR5, CR6,CR7,CR8,CR10,CR11,CR12	1N914	189405A	GE
	FUSES		
F1	2A, 3AG	188200-2	
	LEDS		
DS1,DS2,DS3	Green	89904-45	R/A
	PINS		
E1,E2,E3,E4,E5,E6, E9,E10,E11,E12	Pin	188500-29	Berg 75401
	FUSES		
F1	2A, 3AG	188200-2	
	CONNECTORS		
J1,J2,J3	Pin	188500-29	Berg 75401
J4	F	189397-5	R/A
J5	Pin	188500-29	Berg 75401
J6	BNC F	188357-48	R/A 227161-1
J7	D	89397-20	R/A
	RELAYS		
K1	Relay	1879800-28	Aromat RSD-5V
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3,L4,L5	Inductor	189169-37	Ferroxcube VK200-10/3B
	TRANSISTORS		
Q1,Q2	2N3906	189727A	Motorola
Q3	PN4258	189888A-50	
Q4	U310	18723-75	Unitrode
Q5	PN4258	189888A-50	
Q6,Q7	2N3904	189700A	Motorola

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
Q8	U310	18723-75	Unitrode
Q9	PN4258	189888A-50	
Q10,Q11	MPS918	189774A	
Q12	2N2219	187223-21	
Q13	2N2905	189728-12	
Q15	PN4258	189888A-50	
Q16	2N3906	189727A	Motorola
Q17	2N3904	189700A	Motorola
Q18	PN4258	189888A-50	
Q19,Q20,Q21,Q22,Q23, Q24,Q25	2N3906	189727A	Motorola

RESISTORS

All resistors are in 1/4W 5% ohms unless otherwise specified.

R1	8.45K, 0.12W, 1%	189318A	
R2	6.81K, 0.12W, 1%	189316A	
R3	7.87K, 0.12W, 1%	189317A	
R4	1.78K, 0.12W, 1%	189256A-95	
R5	150, 0.12W, 1%	189256A-10	
R6	10K, 0.12W, 1%	189326A	
R7	4.64K, 0.12W, 1%	189312A	
R8	3.32K, 0.12W, 1%	189482A-24	
R9	1.1K, 0.12W, 1%	189310A	
R10	110, 0.12W, 1%	189256A-57	
R11	2.74K, 0.12W, 1%	187464A	
R12	3.48K, 1%	189327A-91	
R13,R14,R15,R16	10K, 0.12W, 1%	189326A	
R17	1.82K, 0.12W, 1%	188541A-10	
R18	10K, 0.12W, 1%	189326A	
R19	37.4, 0.12W, 1%	188541A-29	
R20	10K, 0.12W, 1%	189326A	
R21	1.82K, 0.12W, 1%	188541A-10	
R22	249, 0.12W, 1%	188541A-11	
R23	82.5, 0.12W, 1%	187457A	
R24,R25	1K, 0.12W, 1%	187460A	
R26,R27,R28	2K	189488A	RC07GF201J
R29	1.1K, 0.12W, 1%	189310A	
R30	2K	189488A	RC07GF201J
R31	100, 0.12W, 1%	189459A	
R34,R35	49.9, 0.12W, 1%	188541A-12	
R36	1.1K, 0.12W, 1%	189310A	
R37	100, 0.12W, 1%	189459A	
R38,R39	10	189231A	RC07GF100J
R41	301, 0.12W, 1%	189327A-42	
R43	332, 0.12W, 1%	189256A-32	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R45	432, 0.12W, 1%	189327A-38	
R46	7.87K, 0.12W, 1%	189317A	
R47	1.27K, 0.12W, 1%	189256A-92	
R48	374, 0.12W, 1%	189327A-37	
R50,R52	432, 0.12W, 1%	189327A-38	
R53	49.9, 0.12W, 1%	188541A-12	
R54	374, 0.12W, 1%	189327A-37	
R55	1K, 0.12W, 1%	187460A	
R57	330	189481A-52	RC07GF331J
R58	2K	189488A	RC07GF201J
R59	100	189202A	RC07GF101J
R60,R61	1K	189220A	RC07GF101J
R62	100	189202A	RC07GF101J
R63	330	189481A-52	RC07GF331J
R64	360	189200A-11	RC07GF361J
R65	33	189478A	RC07GF330J
R66	2.7K	189181A	RC07GF272J
R67	33	189478A	RC07GF330J
R68	220	189233A	RC07GF221J
R69	Potentiometer 200	188453-87	Bourns 3339P-1-201
R70	62	189481A-18	RC07GF620J
R71	1.1K	189200A-27	RC07GF112J
R72	2K	189488A	RC07GF201J
R73	1.1K, 0.12W, 1%	189310A	
R74	110, 0.12W, 1%	189256A-57	
R75	75, 0.12W, 1%	187456A	
R76,R77	20	189477A	RC07GF200J
R78	7.15K	189256A-90	
R79	301, 0.12W, 1%	189327A-42	
R80	76.8K, 0.12W, 1%	189332A	
R81	301, 0.12W, 1%	189327A-42	
R82,R83	200	189484A	RC07GF201J
R86	150, 0.12W, 1%	189256A-10	
R87	200	189484A	RC07GF201J
R88	909, 0.12W, 1%	189253A-29	
R89	243, 0.12W, 1%	189256A-75	
R92	22K	189228A	RC07GF223J
R93	3.8K	189224A	RC07GF382J
R94	1K	189220A	RC07GF101J
R95	56	189232A	RC07GF560J
R96	0.1, 2W, 0.1%	188539-64	
R98,R99,R100,R101	5.1K	189491A	RC07GF512J
R102	2K	189488A	RC07GF201J
R103	5.1K	189491A	RC07GF512J
R104	249K, 1/8W, 1%	89256-80	RN55D249RF
R105	68.1K, 1/8W, 1%	187466	RN55D68R1F
R106	100K, 0.12W, 1%	189330A	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R107	510	189481A-19	RC07GF511J
R108	100K, 0.12W, 1%	189330A	
R109	510	189481A-19	RC07GF511J
R110	11.8K, 1/8W, 1%	88541-67	RN55D11R8F
R111	1.1K, 0.12W, 1%	189310A	
R112	11.8K, 1/8W, 1%	88541-67	RN55D11R8F
R113	1.1K, 0.12W, 1%	189310A	
R114	2K	189488A	RC07GF201J
R115	499, 0.12W, 1%	88541-68	
R116	620	189200A-10	RC07GF5621J
R117	33K	189230A	RC07GF333J
R118	27K	188078A	RC07GF273J
R119	1K, 0.12W, 1%	187460A	
R120	100	189202A	RC07GF101J
	TRANSFORMERS		
T1	Transformer Assembly	1841877-1	MAC
	TERMINAL BLOCKS		
TB1	Terminal Block	189892-25	
TB3	Terminal Block	189892-24	
	TESTPOINTS		
TP1,TP2,TP3,TP4,TP5,TP6	White	188500-19	
TP7	Black	188500-20	
	INTEGRATED CIRCUITS		
U1,U2	Voltage Regulator μA79MGU1C	189889-44	
U3,U4	Voltage Regulator μA78MGU1C	189889-81	
U5	LF353N	189889-95	
U6	NE521	189975-52	
U7	LM311N	189889-11	
U8	LF353N	189889-95	
U9	LM317T	189889-62	
U10	SD5000	189975-51	
U11	TL081CP	189889-84	
U12	LM317T	189975-24	
U13	NE521	189975-52	
	SHORTING PLUGS		
W1,W2,W4,W5	Shorting Plug	188500-23	
	VARISTORS		
VR1	Varistor	189195-1	GEV47-ZA7

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
TRANSMITTER BASEBAND BOARD PWB ASSEMBLY PN 1841556-5			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1	0.1, 63V	189010A-4	
C2	10, 35V	819719A-9	Hilton SWT35Z10
C3	0.1, 63V	189010A-4	
C4	10, 35V	189719A-9	Hilton SWT35Z10
C5	0.1, 63V	189010A-4	
C6	10, 35V	189719A-9	Hilton SWT35Z10
C7	0.1, 63V	189010A-4	
C8	10, 35V	189719A-9	Hilton SWT35Z10
C9,C10,C11,C12,C13	0.1, 63V	189010A-4	
C15	200 pF, 1%	189008A-85	CM05ED201J03
C16	36 pF, 1%	189009A-5	CM05ED360J03
C17	18 pF, 1%	189008A-95	CM05ED180J03
C19,C20	0.1, 63V	189010A-4	
C21	20 pF	189008A-5	CM05ED200J03
C22	0.1, 63V	189010A-4	
C23	91 pF, 1%	189018A-15	CM05ED911J03
C24	24 pF, 1%	189009A-1	CM05ED240J03
C25	43 pF, 1%	189019A-7	CM05ED430J03
C26	36 pF, 1%	189009A-5	CM05ED360J03
C28	0.1, 63V	189010A-4	
C30	10 pF	189116A	CM05ED100J03
C31,C32	10, 35V	189719A-9	Hilton SWT35Z10
C33	0.1, 63V	189010A-4	
C34	5 pF	189078A	CM05ED050J03
C35	1 pF	189017A-13	CM05ED010J03
C36,C37,C38,C39	0.1, 63V	189010A-4	
C40	100 pF	189086A	CM05ED101J03
C41,C42	0.1, 63V	189010A-4	
C43	100 pF	189086A	CM05ED101J03
C45,C46,C47,C48	0.1, 63V	189010A-4	
C49	0.001	189010A-1	
C50,C51	0.1, 63V	189010A-4	
C52	20 pF	189008A-5	CM05ED200J03
C53	0.1, 63V	189010A-4	
C54	0.01	189010A-2	
C55,C56	0.001	189010A-1	
C57	0.01	189010A-2	
C58,C59	0.1, 63V	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C60,C61	0.01	189010A-2	
C62	1	189010A-5	
C63,C64	0.1, 63V	189010A-4	
C65,C66,C67	10, 35V	189719A-9	Hilton SWT35Z10
C68	1	189010A-5	
C69	0.1, 63V	189010A-4	
	DIODES		
CR1,CR2,CR3,CR4,CR5, CR6,CR7,CR8,CR10,CR11,CR12	1N914	189405A	GE
	FUSES		
F1	2A, 3AG	188200-2	
	LEDS		
DS1,DS2,DS3	Green	89904-45	R/A
	PINS		
E1,E2,E3,E4,E5,E6, E9,E10,E11,E12	Pin	188500-29	Berg 75401
	FUSES		
F1	2A, 3AG	188200-2	
	CONNECTORS		
J1,J2,J3	Pin	188500-29	Berg 75401
J4	F	189397-5	R/A
J5	Pin	188500-29	Berg 75401
J6	BNC F	188357-48	R/A 227161-1
J7	D	89397-20	R/A
	RELAYS		
K1	Relay	1879800-28	Aromat RSD-5V
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3,L4,L5	Inductor	189169-37	Ferroxcube VK200-10/3B
	TRANSISTORS		
Q1,Q2	2N3906	189727A	Motorola
Q3	PN4258	189888A-50	
Q4	U310	18723-75	Unitrode
Q5	PN4258	189888A-50	
Q6,Q7	2N3904	189700A	Motorola

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
Q8	U310	18723-75	Unitrode
Q9	PN4258	189888A-50	
Q10,Q11	MPS918	189774A	
Q12	2N2219	187223-21	
Q13	2N2905	189728-12	
Q15	PN4258	189888A-50	
Q16	2N3906	189727A	Motorola
Q17	2N3904	189700A	Motorola
Q18	PN4258	189888A-50	
Q19,Q20,Q21,Q22,Q23, Q24,Q25	2N3906	189727A	Motorola

RESISTORS

All resistors are in 1/4W 5% ohms unless otherwise specified.

R1	8.45K, 0.12W, 1%	189318A	
R2	6.81K, 0.12W, 1%	189316A	
R3	7.87K, 0.12W, 1%	189317A	
R4	1.78K, 0.12W, 1%	189256A-95	
R5	150, 0.12W, 1%	189256A-10	
R6	10K, 0.12W, 1%	189326A	
R7	4.64K, 0.12W, 1%	189312A	
R8	3.32K, 0.12W, 1%	189482A-24	
R9	1.1K, 0.12W, 1%	189310A	
R10	110, 0.12W, 1%	189256A-57	
R11	2.74K, 0.12W, 1%	187464A	
R12	3.48K, 1%	189327A-91	
R13,R14,R15,R16	10K, 0.12W, 1%	189326A	
R17	1.82K, 0.12W, 1%	188541A-10	
R18	10K, 0.12W, 1%	189326A	
R19	53.6, 0.12W, 1%	189256A-22	
R20	10K, 0.12W, 1%	189326A	
R21	1.82K, 0.12W, 1%	188541A-10	
R22	249, 0.12W, 1%	188541A-11	
R23	118, 0.12W, 1%	189256A-60	
R24,R25	1K, 0.12W, 1%	187460A	
R26,R27,R28	2K	189488A	RC07GF201J
R29	1.1K, 0.12W, 1%	189310A	
R30	2K	189488A	RC07GF201J
R31	100, 0.12W, 1%	189459A	
R34,R35	49.9, 0.12W, 1%	188541A-12	
R36	1.1K, 0.12W, 1%	189310A	
R37	100, 0.12W, 1%	189459A	
R38,R39	10	189231A	RC07GF100J
R41	301, 0.12W, 1%	189327A-42	
R43	332, 0.12W, 1%	189256A-32	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R45	432, 0.12W, 1%	189327A-38	
R46	7.87K, 0.12W, 1%	189317A	
R47	1.27K, 0.12W, 1%	189256A-92	
R48	374, 0.12W, 1%	189327A-37	
R50,R52	432, 0.12W, 1%	189327A-38	
R53	49.9, 0.12W, 1%	188541A-12	
R54	374, 0.12W, 1%	189327A-37	
R55	1K, 0.12W, 1%	187460A	
R57	330	189481A-52	RC07GF331J
R58	2K	189488A	RC07GF201J
R59	100	189202A	RC07GF101J
R60,R61	1K	189220A	RC07GF101J
R62	100	189202A	RC07GF101J
R63	330	189481A-52	RC07GF331J
R64	360	189200A-11	RC07GF361J
R65	33	189478A	RC07GF330J
R66	2.7K	189181A	RC07GF272J
R67	33	189478A	RC07GF330J
R68	220	189233A	RC07GF221J
R69	Potentiometer 200	188453-87	Bourns 3339P-1-201
R70	62	189481A-18	RC07GF620J
R71	1.1K	189200A-27	RC07GF112J
R72	2K	189488A	RC07GF201J
R73	1.1K, 0.12W, 1%	189310A	
R74	110, 0.12W, 1%	189256A-57	
R75	75, 0.12W, 1%	187456A	
R76,R77	20	189477A	RC07GF200J
R78	9.53K	189256A-83	
R79	301, 0.12W, 1%	189327A-42	
R80	76.8K, 0.12W, 1%	189332A	
R81	301, 0.12W, 1%	189327A-42	
R82,R83	200	189484A	RC07GF201J
R86	150, 0.12W, 1%	189256A-10	
R87	200	189484A	RC07GF201J
R88	909, 0.12W, 1%	189253A-29	
R89	243, 0.12W, 1%	189256A-75	
R92	22K	189228A	RC07GF223J
R93	3.8K	189224A	RC07GF382J
R94	1K	189220A	RC07GF101J
R95	56	189232A	RC07GF560J
R96	0.1, 2W, 0.1%	188539-64	
R98,R99,R100,R101	5.1K	189491A	RC07GF512J
R102	2K	189488A	RC07GF201J
R103	5.1K	189491A	RC07GF512J
R104	249K, 1/8W, 1%	89256-80	RN55D249RF
R105	68.1K, 1/8W, 1%	187466	RN55D68R1F
R106	100K, 0.12W, 1%	189330A	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R107	510	189481A-19	RC07GF511J
R108	100K, 0.12W, 1%	189330A	
R109	510	189481A-19	RC07GF511J
R110	8.87K, 1/8W, 1%	89481-17	RN55D8R87F
R111	1.13K, 1/8W, 1%	89327-76	RN55D1R13F
R112	8.87K, 1/8W, 1%	88481-17	RN55D8R87F
R113	1.13K, 1/8W, 1%	89327-76	RN55D1R13F
R114	2K	189488A	RC07GF201J
R115	499, 0.12W, 1%	88541-68	
R116	620	189200A-10	RC07GF5621J
R117	33K	189230A	RC07GF333J
R118	27K	188078A	RC07GF273J
R119	1K, 0.12W, 1%	187460A	
R120	100	189202A	RC07GF101J
	TRANSFORMERS		
T1	Transformer Assembly	1841877-1	MAC
	TERMINAL BLOCKS		
TB1	Terminal Block	189892-25	
TB3	Terminal Block	189892-24	
	TESTPOINTS		
TP1,TP2,TP3,TP4,TP5,TP6	White	188500-19	
TP7	Black	188500-20	
	INTEGRATED CIRCUITS		
U1,U2	Voltage Regulator μA79MGU1C	189889-44	
U3,U4	Voltage Regulator μA78MGU1C	189889-81	
U5	LF353N	189889-95	
U6	NE521	189975-52	
U7	LM311N	189889-11	
U8	LF353N	189889-95	
U9	LM317T	189889-62	
U10	SD5000	189975-51	
U11	TL081CP	189889-84	
U12	LM317T	189975-24	
U13	NE521	189975-52	
	SHORTING PLUGS		
W1,W2,W4,W5	Shorting Plug	188500-23	
	VARISTORS		
VR1	Varistor	189195-1	GEV47-ZA7

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
LINE EQUALIZER PWB ASSEMBLY PN 1841568-1			
	CONNECTORS		
J1,J2,J3,J4,J5,J6	Socket	18850-31	Berg D25.SQ
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R1	18.7, 1/8W, 1%	189327A-80	RN55D18R7F
R2	301, 1/8W, 1%	189327A-42	RN55D301RF
R3	18.7, 1/8W, 1%	189327A-80	RN55D18R7F
R4	301, 1/8W, 1%	189327A-42	RN55D301RF

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
LINE EQUALIZER PWB ASSEMBLY PN 1841568-2			
	CONNECTORS		
J1,J2,J3,J4,J5,J6	Socket	18850-31	Berg D25.SQ
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R1	44.2, 1/8W, 1%	188541A-19	RN55D44R2F
R2	365, 1/8W, 1%	188541A-17	RN55D365RF
R3	44.2, 1/8W, 1%	188541A-19	RN55D44R2F
R4	365, 1/8W, 1%	188541A-17	RN55D365RF

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
LINE EQUALIZER PWB ASSEMBLY PN 1841568-3			
	CONNECTORS		
J1,J2,J3,J4,J5,J6	Socket	18850-31	Berg D25.SQ
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R1	18.7, 1/8W, 1%	189327A-80	RN55D18R7F
R2	301, 1/8W, 1%	189327A-42	RN55D301RF
R3	18.7, 1/8W, 1%	189327A-80	RN55D18R7F
R4	301, 1/8W, 1%	189327A-42	RN55D301RF

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
LINE EQUALIZER PWB ASSEMBLY PN 1841568-4			
	CONNECTORS		
J1,J2,J3,J4,J5,J6	Socket	18850-31	Berg D25.SQ
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R1	41.2, 1/8W, 1%	188541A-16	RN55D41R2F
R2	332, 1/8W, 1%	189256A-32	RN55D332RF
R3	41.2, 1/8W, 1%	188541A-16	RN55D41R2F
R4	332, 1/8W, 1%	189256A-32	RN55D332RF

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
LINE EQUALIZER PWB ASSEMBLY PN 1841568-5			
	CONNECTORS		
J1,J2,J3,J4,J5,J6	Socket	18850-31	Berg D25.SQ
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R1	56.2, 1/8W, 1%	187453A	RN55D56R2F
R2	453, 1/8W, 1%	188541A-18	RN55D453RF
R3	56.2, 1/8W, 1%	187453A	RN55D56R2F
R4	453, 1/8W, 1%	188541A-18	RN55D453RF

REF DES	DESCRIPTION	PART NO.	SIMILAR TO

CABLE SIMULATOR PWB ASSEMBLY PN 1842711

Table 1

	-10, -30	-2	-44	-5
R1,R2,R9,R10	Jumper 88328-7	Jumper 88328-7	Jumper 88328-7	Jumper 88328-7
R3,R6	18.7Ω, 1% 189327A-80	44.2Ω, 1% 188541A-19	41.2Ω, 1% 188541A-16	56.2Ω, 1% 187453A
R4,R7	301Ω, 1% 189327A-42	365Ω, 1% 188541A-17	332Ω, 1% 189256A-32	453Ω, 1% 188541A-18

Table 2

	-40	-41	-42	-43
R1,R2,R9,R10	56Ω 189232A			56Ω 189232A
R3,R6	12Ω, 1% 189475			12Ω, 1% 189475
R4,R7	910Ω, 1% 189200A-19			910Ω, 1% 189200A-19
R5,R11	12Ω, 1% 189475			15Ω, 1% 189239A
R8	430Ω, 1% 189328A-31			330Ω, 1% 189205A
C1	510 pF 189017A-51			330 pF 189089A
C2	560 pF 189017A-2			OPEN
L1	6.8 µH 89169-64			1.8 µH 189169-56

REF DES	DESCRIPTION	PART NO.	SIMILAR TO

LINE EQUALIZER PWB ASSEMBLY PN 1841973

Table 1 (Group 1 and 3)

	-11, -31	-12, -32	-13, -33	-14, -34
C1,C2		2200 pF 89018-61		4700 pF 89018-64
R1,R6		43Ω 189481A		39... 189480A
R4		110Ω 189483A		130Ω 189200A-17
R2,R3,R5,R7		51Ω 189238A-38		51Ω 189238A-38
L1		10 µH 89169-66		22 µH 189169-58

Table 2 (Group 2)

	-21	-22	-23	-24
C1,C2		1800 pF 89018-60		3900 pF 89018-63
R1,R6		51Ω 189238A-38		47... 189201A
R4		120Ω 189203A		150Ω 189204A
R2,R3,R5,R7		62Ω 189481A-18		62Ω 189481A-18
L1		12 µH 89169-73		27 µH 189169-96

Table 3 (Group 4)

	-40	-41	-42	-43	-44
C1,C2	4700 pF 89018-64			1500 pF 89018-59	
R1,R6	39Ω 189480A			36... 189204A	
R4	130Ω 189200A-17			36Ω 189479	
R2,R3,R5,R7	62Ω 189238A-38			62Ω 189238A-38	
L1	22 µH 189169-58			6.8 µH 189169-64	

Table 4 (Group 5)

	-51	-52	-53	-54
C1,C2		1500 pF 89018-59		3300 pF 89018-62
R1,R6		62Ω 189481A-18		56... 189232A
R4		150Ω 189204A		180Ω 189200A-3
R2,R3,R5,R7		75Ω 189280A		75Ω 189280A
L1		15 µH 189169A-5		33 µH 189169A-84

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
METER ASSEMBLY PN 1841749-1			
	Meter	1841470-1	MAC
	Polarizing Key	189396-81	
J5	Connector, 5 Position, IDT	189396-91	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
TRANSMITTER POWER SUPPLY ASSEMBLY PN 1841570-2			
	Power Supply PWB Assembly	1841554-2	MAC
	Transformer	1841573	MAC
	Bracket	1841571-1	MAC
	Connector, Filtered, AC Input	189198-92	MAC
CR1,CR3	Bridge Rectifier, BR-66	189439-40	
Q2	Transistor, MJE-6044	189888-51	
	Lug, Crimp	188380-76	
	Fuses		
	1A Slo-Blo	188200-7	
	0.5A Slo-Blo (Optional)	188200-27	
	Heatsink	842117-1	MAC
	Without Heatsink	842117-2	MAC

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
TRANSMITTER POWER SUPPLY PWB ASSEMBLY PN 1841554-2			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2,C3	4700, 35V	189719-56	
C4	10, 35V	189719A-9	Hilton SWT35Z10
C5	560 pF	189008A-4	CD15
C6	10 pF	189116A	CM05ED100J03
C7,C8	10, 35V	189719A-9	Hilton SWT35Z10
C9	0.01	189010A-2	
C10	10, 35V	189719A-9	Hilton SWT35Z10
	DIODES		
CR2	Rectifier Bridge BR-66	189439-40	
CR4	1N914A	189405A	GE
CR5	1N823	Zener, 1N823	189437A
CR6	1N914A	189405A	GE
	TERMINALS		
E1,E2,E3,E4,E5,E6,E7,E8,E9, E10,E11,E12,E13,E14,E15, E16,E17,E18	Bifurcated	184844-33	
	CONNECTORS		
J1	Pin	188500-29	Berg 75401
	TRANSISTORS		
Q1	2N2905	189728-12	
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R1	820	189207A	RC07GF821J
R2	Potentiometer, 200	188453-74	Helitrim
R3	1K	189220A	RC07GF101J
R4	48.7K, 1/8W, 1%	189327A-25	RN55D48R7F
R5	15K, 1/8W, 1%	189327A-92	RN55D15R0F
R6	48.7K, 1/8W, 1%	189327A-25	RN55D48R7F
R7	84.5K, 1/8W, 1%	189327A-94	RN55D84R5F
R8	100K, 1/8W, 1%	189330A	RN55D1004RF
R9	3.9K	189224A	RC07GF392J
R10	300	189486A	RC07GF301J
R11	39	189480A	RC07GF390J
R12	5.6K	189226A	RC07GF562J
R13	100	189202A	RC07GF101J
R14,R15	2K, 1/8W, 1%	189327A-82	RN55D2001F
R16	Potentiometer, 500	188453-36	Helitrim
R17	3K, 1/8W, 1%	189256A-86	RN55D3001F
R18	750	189487A	RC07GF751J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R19	10K	189227A	RC07GF103J
R20	75K	189200A-8	RC07GF753J
R21	240	189200A-4	RC07GF241J
R22	2.4K	189489A	RC07GF242J
R23	4.7K	189225A	RC07GF472J
	INTEGRATED CIRCUITS		
U1	TL085IJ	189976-96	
U2	mA79M06AUC	189889-5	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
DC/DC CONVERTER ASSEMBLY 843490-2			
	DC/DC Converter PWB Assembly	843492-1	MAC
	Bracket	843491-1	MAC
	Heatsink	843504-1	MAC
	Wire Harness Assembly	843755-2	
	Terminal Block, 2 Position	89892-39	
HY1,HY2	DC/DC Converter #132	843494-4	Vicor
	Integrated Circuit, LM317T	89889-62	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
DC/DC CONVERTER PWB ASSEMBLY PN 843492-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2	750 pF	89007-3	CM05ED751J03
C3	10, 100V	89720-14	
C4	40, 75V	88129	
C5	0.01, 100V, 5%	189010A-2	
C6,C7,C8,C9	100, 50V	189719-88	
C10,C11	1.5, 50V	89016	Kemet K1R5W50
C12,C13,C14	1000 pF	189008-89	
C15,C16	750 pF	89007-3	CM05ED751J03
	DIODES		
CR1	1N4006	189440A-58	
	TERMINALS		
E1,E2	Bifurcated 145M	184844-33	
	CONNECTORS		
J1,J2	Pin	188500-29	Berg
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1	Choke	189169-37	VK200
L2	Inductor	89761	5220
L3,l4,L5,L6	Choke	189169-37	VK200
	RESISTORS		
All resistors are in ohms 1/4W 5% unless otherwise specified.			
R1	7.5K	189481A-44	RC07GF752J
R2	Potentiometer, 10K	88453-73	
R3	7.5K	189481A-44	RC07GF752J
R4	Potentiometer, 10K	88453-73	
R5,R6	3.32K, 1/8W, 1%	89327-93	RN55D3R32F
R7	243, 1/8W, 1%	89256-75	RN55D243RF
R8	1.74K, 1/8W, 1%	89327-93	RN55D1R74F
R9	8.2K	189237A	RC07GF822J
R10	3.9K	189224A	RC07GF392J
R11	3.32K, 1/8W, 1%	89327-93	RN55D3R32F
R12	3.48K, 1/8W, 1%	189327A-91	RN55D3R48F

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	INTEGRATED CIRCUITS		
U1	LM311	189889-11	
	VARISTORS		
VR1	Varistor	89195-9	GE V68Z10

RECEIVER ASSEMBLY PN 1841560-1

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	Chassis Assembly	1841549-1	MAC
	Power Suppy Assembly	1841570-1	MAC
	Descrambler PWB Assembly (Optional)	1841566-99	MAC
	Meter Assembly	1841749-1	MAC
	110 Vac Accessory Kit	842456-1	MAC
	Receiver Baseband Board PWB Assembly	1841562-1	MAC
	P/S Interconnect Wire Harness Assy	1841574-1	MAC
	Front Panel, Extrusion	1841551-1	MAC
	Cover	1841559-1	MAC
	Cover, Wrap-Around (used w/desk top option)	1841469-1	MAC
	Extrusion, Side Mount	1831572-1	MAC
	Front Panel End Cap (used w/desk top option)	1841468-1	MAC
	Bind Post	88500-39	MAC
	Heatsink D.R.	1831844-1	MAC
	Meter Retainer	1841646-1	MAC
	AC Input Shield	1841799-1	MAC
	Foam Pad	1842054-1	MAC

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RECEIVER BASEBAND BOARD PWB ASSEMBLY PN 1841562-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2	15 pF	189117A	CM05ED150J03
C3	12 pF	189085A	CM05ED120J03
C4,C5	1000 pF	189010A-1	
C6	33 pF	189139A	CM05ED330J03
C7	1000 pF	189010A-1	
C8	33 pF	189139A	CM05ED330J03
C9,C10	0.01, 10%	189010A-2	
C12	10, 35V	189719A-9	Hilton SWT35Z10
C13	1000 pF	189010A-1	
C14	0.1, 10%	189010A-4	
C15	1000 pF	189010A-1	
C16,C17	10, 35V	189719A-9	Hilton SWT35Z10
C18	0.01, 10%	189010A-2	
C20	10, 35V	189719A-9	Hilton SWT35Z10
C21	1000 pF	189010A-1	
C22,C23	0.01, 10%	189010A-2	
C24	510 pF	189017A-51	CM05ED511J03
C25	1000 pF	189010A-1	
C26,C27,C28	0.01, 10%	189010A-2	
C29	1000 pF	189010A-1	
C30	0.1, 10%	189010A-4	
C31	1000 pF	189010A-1	
C32,C33,C34,C35	0.1, 10%	189010A-4	
C36,C37	0.01, 10%	189010A-2	
C38	0.1, 10%	189010A-4	
C39,C40,C41,C42,C43	0.01, 10%	189010A-2	
C44,C45	62 pF	189008A-71	CM05ED620J03
C46	0.1, 10%	189010A-4	
C47	100 pF	189086A	CM05ED101J03
C48	0.1, 10%	189010A-4	
C49	6 ± 0.5 pF	89017A-53	
C50	8 pF	189008A-86	CM05ED080J03
C51,C52	200 pF	189008A-8	CM05ED201J03
C53,C54	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C55	18 pF	189008A-95	
C56	0.01, 10%	189010A-2	
C57	82 pF	189081A	CM05ED820J03
C58	12 pF	189085A	CM05ED120J03
C59	300 pF	189017A-52	CM05ED301J03
C60	3 pF	189079A	CM05ED030J03
C61	270 pF	189141A	CM05ED271J03
C62	10, 35V	189719A-9	Hilton SWT35Z10
C63	0.1, 10%	189010A-4	
C64	1, 20%	189010A-5	
C65	430, 1%	189018-18	CM05ED431J03
C66	10, 35V	189719A-9	Hilton SWT35Z10
C67	0.1, 10%	189010A-4	
C68	1, 10%	189010A-5	
C69	100 pF, 1%	189008-80	CM05ED101J03
C70	27 pF, 1%	189009-2	CM05ED270J03
C71	1000 pF, 1%	89018-54	
C72	120 pF, 1%	89008-10	CM05ED121J03
C73	20 pF	189008A-5	CM05ED200J03
C74	0.1, 10%	189010A-4	
C75	1000 pF	189010A-1	
C76	390 pF, 1%	189017-1	CM05ED391J03
C77	39 pF, 1%	89018-58	CM05ED390J03
C78	300 pF, 1%	189008-73	CM05ED301J03
C79	43 pF, 1%	189018-12	CM05ED430J03
C80	20 pF	189008A-5	CM05ED200J03
C81	0.1, 10%	189010A-4	
C82	0.01, 10%	189010A-2	
C83	10, 35V	189719A-9	Hilton SWT35Z10
C84,C85,C86,C87	0.1, 10%	189010A-4	
C88	1800 pF	189008-31	
C89	0.01, 10%	189010A-2	
C90	0.01, 1%	188212-87	
C91,C92,C93,C94,C95, C96,C97	0.1, 10%	189010A-4	
C98	470 pF, 1%	189008A-29	CM05ED471J0
C99	100 pF, 1%	189008-80	CM05ED101J03
C100,C101,C102	0.1, 10%	189010A-4	
C103	1000 pF	189010A-1	
C104	820 pF, 1%	189017-4	CM05ED821J03
C105	1000 pF, 5%	189008-89	
C106	470 pF	189008A-29	CM05ED471J03
C107,C108,C109,C110,C111	10, 35V	189719A-9	Hilton SWT35Z10
C112	1000 pF	189010A-1	
C113	10, 35V	189719A-9	Hilton SWT35Z10
C114,C115	0.01, 10%	189010A-2	
C116,C117	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C118,C119,C120	0.01, 10%	189010A-2	
C121	1, 20%	189010A-5	
C122,C123,C124,C125,C126, C127,C128,C129,C130	0.01, 10%	189010A-2	
C131	0.1, 10%	189010A-4	
C132	0.01, 10%	189010A-2	
C133,C134	0.1, 10%	189010A-4	
C135,C136	0.01, 10%	189010A-2	
C138	0.1, 10%	189010A-4	
C139,C140	0.01, 10%	189010A-2	
C141	1, 20%	189010A-5	
C142	0.01, 10%	189010A-2	
C143	1000 pF	189010A-1	
C144,C145,C146,C147,C148, C149,C150,C151,C152	0.01, 10%	189010A-2	
C153	10, 35V	189719A-9	Hilton SWT35Z10
C154	0.01, 10%	189010A-2	
C155	10, 35V	189719A-9	Hilton SWT35Z10
C156,C157	0.01, 10%	189010A-2	
C158	10, 35V	189719A-9	Hilton SWT35Z10
C159	0.01, 10%	189010A-2	
C160	10, 35V	189719A-9	Hilton SWT35Z10
C161	0.01, 10%	189010A-2	
C162	1000 pF	189010A-1	
C163	0.01, 10%	189010A-2	
C164,C165	1000 pF	189010A-1	
C166	0.01, 10%	189010A-2	
C167	1000 pF	189010A-1	
C168	10, 35V	189719A-9	Hilton SWT35Z10
C169	1000 pF	189010A-1	
C170	10, 35V	189719A-9	Hilton SWT35Z10
C171	1000 pF	189010A-1	
C172	0.01, 10%	189010A-2	
C173	1000 pF	189010A-1	
C174	10, 35V	189719A-9	Hilton SWT35Z10
C175	1000 pF	189010A-1	
C176	10, 35V	189719A-9	Hilton SWT35Z10
C177	220, 25V	89719A-75	Hilton SWT25Z220
C178	1, 20%	189010A-5	
C179	220, 25V	89719A-75	Hilton SWT25Z220
C180	0.1, 10%	189010A-4	
C182	220, 25V	89719A-75	Hilton SWT25Z22
C183	0.01, 10%	189010A-2	
C184	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C185	10, 35V	189719A-9	Hilton SWT35Z10
C186	0.1, 10%	189010A-4	
C187	68 pF	189008A-42	CM05ED680J03
C188	1000 pF	189010A-1	
C189,C190,C191,C192,C193, C194,C195	0.01, 10%	189010A-2	
C196	0.1, 10%	189010A-4	
C197	1, 20%	189010A-5	
C198	0.1, 10%	189010A-4	
C199	8.2, 15V, 20%	189765A	Kemet K8R2W15
C200	10, 35V	189719A-9	
	DIODES		
CR1,CR2,CR3	1N914A	189405A	GE
CR4	1N823A	189437A	
CR5,CR6	1N914A	189405A	GE
CR7	BB505, BB121, or BB141	189439A-44	
CR8,CR9,CR10,CR11,CR12,CR13	1N914A	189405A	GE
CR14	MV209	189439-38	
CR15	1N914A	189405A	GE
CR17	BB505, BB121, or BB141	189439A-44	
CR18,CR19	1N6263	89440-86	
	LEDS		
DS1,DS2,DS3	LED	89904-45	
	PINS		
E1,E2,E3,E4,E5,E6,E7,E8,E9, E10,E11,E12,E13,E14,E15,E16, E17,E20,E21,E22,E23,E24, E30,E31,E32,E33,E34,E35, E36,E37,E38	Pin	188500-23	
	FUSES		
F1	2A, 250V Buss AGC	188200-2	
F2	0.5A, Buss AGC	188203	
F3	40 MHz Filter	1841578-1	
	CONNECTORS		
J1	F	189397-5	
J2	BNC	188357-48	
J3,J4	Pin	188500-29	
J5	D	89397-20	
	RELAYS		
K1	Relay	189800-28	Aromat RSD-5V

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2	2.5T	189162-31	
L3	1.5T Shielded	189162-36	
L4	0.56	189169A-57	
L5	1.2	189169A-65	
L6	0.56	189169A-57	
L7	3.3	189169A-31	
L8	Choke	189169-37	Ferroxcube VK200/3B-10
L9,L10	1	189169A-40	
L11	Choke	189169-37	Ferroxcube VK200/3B-10
L12	1.5T Unshielded	189162-89	
L14	Choke	189169-37	Ferroxcube VK200/3B-10
L16	1.2	189169A-65	
L17	1.8	189169A-56	
L18	200, 5%	187293	Delvan 1537
L19	20-1/2T	89162-66	Coilcraft T7-143
L20	17-1/2T	89162-65	Coilcraft T7-143
L21,L22,L23,L24,L25,L26,L27	Choke	189169-37	Ferroxcube VK200/3B-10
L28	22	189161A-1	
L29,L30	Choke	189169-37	Ferroxcube VK200/3B-10
	MIXERS		
M1,M2,M3,M4,M5,M6	SBL1	89887-3	
	TRANSISTORS		
Q1	2N3904	189700A	Motorola
Q2,Q5	3SK121	189888-53	
Q6	NE41632B	189888-39	
Q7,Q8	MPS918	189774A	
Q9	2N3904	189700A	Motorola
Q10	2N3906	189727A	Motorola
Q11,Q12	VN10KM	89888-70	
Q13	2N3904	189700A	Motorola
Q14,Q15	NE41632B	189888-39	
Q16	2N3904	189700A	Motorola
Q17,Q18	PN4258	189888-50	
Q19	2N3904	189700A	Motorola
Q20	U310	187223-75	Unitrode
Q21	2N3904	189700A	Motorola
Q22	U310	187223-75	Unitrode

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
Q23,Q24	PN4258	189888-50	
Q25	2N3904	189700A	Motorola
Q26	2N3906	189727A	Motorola
Q27,Q28	2N3904	189700A	Motorola

RESISTORS

All resistors are in 1/4W 5% ohms unless otherwise specified.

R1	10	189231A	RC07GF100J
R3	68	189482A	RC07GF680J
R4	560	189235A	RC07GF561J
R5	100	189202A	RC07GF101J
R6,R7	300	189486A	RC07GF301J
R8	75	189280A	RC07GF750J
R9	11K	189238A-35	RC07GF113J
R10	910	189200A-19	
R11	10	189231A	RC07GF100J
R12,R13	10K	189227A	RC07GF103J
R15	510	189481A-19	RC07GF511J
R20	390	189180A	RC07GF391J
R21	110K	189238A-58	RC07GF114J
R22	39K	189494A	RC07GF393J
R23	30K	189481A-25	RC07GF303J
R24	330	189205A	RC07GF331J
R25	33	189478A	RC07GF330J
R26	68	189482A	RC07GF680J
R27	150	189204A	RC07GF151J
R28,R29	100K	189278A	RC07GF104J
R30	3.9K	189224A	RC07GF392J
R31	2.7K	189181A	RC07GF272J
R32	620	189200A-10	RC07GF621J
R33	22K	189228A	RC07GF223J
R38	150	189204A	RC07GF151J
R39	510	189481A-19	RC07GF511J
R41	300	189486A	RC07GF301J
R42,R43,R44	510	189481A-19	RC07GF511J
R45	220	189233A	RC07GF221J
R46	150	189204A	RC07GF151J
R47	68	189482A	RC07GF680J
R48	330	189205A	RC07GF331J
R49	68	189482A	RC07GF680J
R50	200	189484A	RC07GF201J
R51	510	189481A-19	RC07GF511J
R52	2.4K	189489A	RC07GF242J
R53	910	189200A-19	RC07GF911J
R54	1K	189220A	RC07GF101J
R55,R56,R57,R58	270	189485A	RC07GF271J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R59,R60,R61,R62	33	189478A	RC07GF330J
R63,R64	150	189204A	RC07GF151J
R65	1K	189220A	RC07GF101J
R66	1.2K	189221A	RC07GF122J
R67	1.8K	188248A	RC07GF182J
R68,R69	150	189204A	RC07GF151J
R70,R71	75	189280A	RC07GF750J
R72,R73,R74,R75	15.8K, 1/8W, 1%	188272A	RN55D15R8F
R76	1K, 1/8W, 1%	187460A	RN55D1001F
R77	200, 1/8W, 1%	189327A-62	RN55D2001F
R78	1M, 1/8W, 1%	188541A-34	RN55D1005F
R79	1K	189220A	RC07GF101J
R80	24K	189481A-14	RC07GF243J
R81	1.1K	189200A-27	RC07GF112J
R82	2K	189488A	RC07GF201J
R83	130	189200A-17	RC07GF131J
R84	10K	189227A	RC07GF103J
R85	2K	189488A	RC07GF201J
R86	3.9K	189224A	RC07GF392J
R87	1K	189220A	RC07GF101J
R88	820	189207A	RC07GF821J
R89,R90,R91,R92	2K	189488A	RC07GF201J
R93	1K	189220A	RC07GF101J
R94	5.1K	189491A	RC07GF512J
R95	3K	189490A	RC07GF301J
R96,R97	56	189232A	RC07GF560J
R98	20K	189200A-14	RC07GF203J
R100	620	189200A-10	RC07GF621J
R101	15	189239A	RC07GF150J
R102	330	189205A	RC07GF331J
R103	39	189480A	RC07GF390J
R104	510	189481A-19	RC07GF511J
R105	270	189485	RC07GF271J
R106	43	189481	RC07GF430J
R107	270	189485	RC07GF271J
R108	Potentiometer, 200	188453-43	Bourns
R109	2K	189488A	RC07GF201J
R110	330	189205A	RC07GF331J
R111	1.2K	189221A	RC07GF122J
R113,R114	604, 1/8W, 1%	189256-33	RN55D604RF
R115	348, 1/8W, 1%	89262-24	RN55D348RF
R116	330	189205A	RC07GF331J
R117	240	189200A-4	RC07GF241J
R118	1.07K, 1/8W, 1%	189262A-28	RN55D1R07F
R119	523, 1/8W, 1%	189327-39	RN55D523RF

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R120	1.21K, 1/8W, 1%	189256-13	RN55D1R21F
R121	215, 1/8W, 1%	189256A-7	RN55D215RF
R122	374, 1/8W, 1%	189327A-37	RN55D374RF
R123	215, 1/8W, 1%	189256A-7	RN55D215RF
R124,R125	523, 1/8W, 1%	189327-39	RN55D523RF
R126,R127	100	189202A	RC07GF101J
R128	330	189205A	RC07GF331J
R129,R130	1K	189220A	RC07GF101J
R131	100	189202A	RC07GF101J
R132	330	189205A	RC07GF331J
R133	374, 1/8W, 1%	189327A-37	RN55D374RF
R134	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R135	7.87K	189481A-36	RN55D7R87F
R136	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R137	75, 1/8W, 1%	187456A	RN55D75R0F
R138,R139	130, 1/8W, 1%	189327A-27	RN55D131J
R140	1.1K	189200A-27	RC07GF112J
R141	110	189483A	RC07GF111J
R142	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R143,R144	10K, 1/8W, 1%	189326A	RN55D1003F
R145	1K	189220A	RC07GF101J
R146	20, 1/8W, 1%	89262-19	RN55D200RF
R147	75, 1/8W, 1%	187456A	RN55D75R0F
R148,R149	1M	189238A-30	RC07GF105J
R150	2K	189488A	RC07GF201J
R151	510	189481A-19	RC07GF511J
R152	430	189238A-31	RC07GF431J
R153	820	189207A	RC07GF821J
R154	6.2K	189200A-5	RC07GF622J
R155	5.1K	189491A	RC07GF512J
R156	6.2K	189200A-5	RC07GF622J
R157,R158,R159,R160	150	189204A	RC07GF151J
R161,R162	24	189238A-20	RC07GF240J
R163	390	189180A	RC07GF391J
R165,R166	33	189478A	RC07GF330J
R167,R168	270	189485A	RC07GF271J
R169	33	189478A	RC07GF330J
R170	270	189485A	RC07GF271J
R171,R172	75	189280A	RC07GF750J
R173,R174	15.8K, 1/8W, 1%	188272A	RN55D15R8F

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R175,R176	5.76K, 1/8W, 1%	189314	RN55D5R76F
R177	270	189485A	RC07GF271J
R178	33	189478A	RC07GF330J
R179	10.5K, 1/8W, 1%	189256-78	RN55D10R5F
R180	402K, 1/8W, 1%	188541A-54	RN55D402RF
R181	10K	189227A	RC07GF103J
R182,R183	2K	189488A	RC07GF201J
184	130	189200A-17	RC07GF131J
R185	3.01K, 1/8W, 1%	188541A-59	RN55D3R01F
R186	1.5K, 1/8W, 1%	189256A-16	RN55D1R50F
R187	3K	189490A	RC07GF301J
R188	9.1K	189200A-12	RC07GF912J
R189	1M, 1/8W, 1%	188541A-34	RN55D1005F
R190	3K	189490A	RC07GF301J
R191	9.1K	189200A-12	RC07GF912J
R192,R193,R194,R195	2K	189488A	RC07GF201J
R196	1K, 1/8W, 1%	187460A	RN55D1001F
R197	1M	189238A-30	RC07GF105J
R199	75	189280A	RC07GF750J
R200	150	189204A	RC07GF151J
R201	470	189234A	RC07GF471J
R202,R203,R204	2K	189488A	RC07GF201J
R205	12, 1W, 5%	188539A-84	
R206	68K	189276A	RC07GF683J
R207	2.7	189481A-13	
R208,R209,R210,R211,R212, R213,R214	1K	189220A	RC07GF101J
R215	510	189481A-19	RC07GF511J
R216	82.5, 1/8W, 1%	187457A	RN55D82R5F
R217	200, 1/8W, 1%	189327A-62	RN55D2001F
R218	Potentiometer, 50K	188453-40	Bourns
R219	82.5, 1/8W, 1%	187457A	RN55D82R5F
R220	200, 1/8W, 1%	189327A-62	RN55D2001F
R221	Potentiometer, 50K	188453-40	Bourns
R222	160, 1/8W, 5%	189262-23	
R224	1K, 1/8W, 1%	187460A	RN55D1001F
R225	4.42K, 1/8W, 1%	189256A-88	RN55D4R42F
R226	6.81K, 1/8W, 1%	189316A	RN55D6R81F
R227	15	189239A	RC07GF150J
R228	10	189231A	RC07GF100J
R229	2K	189488A	RC07GF201J
R230	6.04K, 1/8W, 1%	189256-84	RN55D6R04F
R232,R233,R234	1K	189220A	RC07GF101J
R235	1.82K, 1/8W, 1%	188541A-10	RN55D1R82F
R236	10K	189227A	RC07GF103J
R238	1.2K	189221A	RC07GF122J
R239	1K	189220A	RC07GF101J
R240	100	189202A	RC07GF101J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	RESISTOR NETWORKS		
RN2,RN3	10K, 1%	188540-32	4114R-001
	TRANSFORMERS		
T1	Transformer	1841877-1	
T2	Transformer	1840056-2	
	TERMINAL BLOCKS		
TB1	3 Position	189892-24	
TB3	4 Position	189892-25	
	TESTPOINTS		
TP1,TP2,TP3,TP4,TP5	White	188500-19	
TP6	Black	188500-20	
	INTEGRATED CIRCUITS		
U1	78MGU	189889-82	
U2	LF353N	189889-95	
U3	10H116	189975-25	
U4	10131	189976-34	
U5	TL084	189976-96	
U6	74LS01	189976-65	
U7	LM311	189889-11	
U8	LM319N	189975-24	
U9,U10	733	189889-76	
U11,U12	AM687	189976-66	
U13,U14	10131	189976-34	
U15	10102	189976-33	
U16	LF353N	189889-95	
U17	10125	189975-67	
U18	74HC132	89974-33	
U19	10131	189976-34	
U20	TL084	189976-96	
U21	LM311	189889-11	
U22	LM319N	189975-24	
U23	74LS01	189976-65	
U24	MC1648P	189889-8	
U25	LM317L	189975-69	
U26	78M12T	189889-25	
U27	MC7912 Voltage Regulator	89976-67	
U28	79M05T	189889-91	
U29	7805T	189975-72	
U30	LM317T	189889-62	
U31	AM687	189976-66	
U32	MC1648P	189889-8	
U33	MWA130 Hybrid Amp	189889-72	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	VARISTORS		
VR1,VR2	Varistor	189195-1	GE V47ZA7
	SHORTING PLUGS		
W1,W2,W3,W4,W5,W6,W7	Shorting Plug	188500-23	
	CRYSTALS		
Y1	10.000 MHz	189526-17	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RECEIVER BASEBAND BOARD PWB ASSEMBLY PN 1841562-2			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2	15 pF	189117A	CM05ED150J03
C3	12 pF	189085A	CM05ED120J03
C4,C5	1000 pF	189010A-1	
C6	33 pF	189139A	CM05ED330J03
C7	1000 pF	189010A-1	
C8	33 pF	189139A	CM05ED330J03
C9,C10	0.01, 10%	189010A-2	
C12	10, 35V	189719A-9	Hilton SWT35Z10
C13	1000 pF	189010A-1	
C14	0.1, 10%	189010A-4	
C15	1000 pF	189010A-1	
C16,C17	10, 35V	189719A-9	Hilton SWT35Z10
C18	0.01, 10%	189010A-2	
C20	10, 35V	189719A-9	Hilton SWT35Z10
C21	1000 pF	189010A-1	
C22,C23	0.01, 10%	189010A-2	
C24	510 pF	189017A-51	CM05ED511J03
C25	1000 pF	189010A-1	
C26,C27,C28	0.01, 10%	189010A-2	
C29	1000 pF	189010A-1	
C30	0.1, 10%	189010A-4	
C31	1000 pF	189010A-1	
C32,C33,C34,C35	0.1, 10%	189010A-4	
C36,C37	0.01, 10%	189010A-2	
C38	0.1, 10%	189010A-4	
C39,C40,C41,C42,C43	0.01, 10%	189010A-2	
C44,C45	62 pF	189008A-71	CM05ED620J03
C46	0.1, 10%	189010A-4	
C47	100 pF	189086A	CM05ED101J03
C48	0.1, 10%	189010A-4	
C49	6 ± 0.5 pF	89017A-53	
C50	8 pF	189008A-86	CM05ED080J03
C51,C52	1000 pF	189010A-1	
C53,C54	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C55	18 pF	189008A-95	
C56	0.01, 10%	189010A-2	
C57	82 pF	189081A	CM05ED820J03
C58	12 pF	189085A	CM05ED120J03
C59	300 pF	189017A-52	CM05ED301J03
C60	3 pF	189079A	CM05ED030J03
C61	270 pF	189141A	CM05ED271J03
C62	10, 35V	189719A-9	Hilton SWT35Z10
C63	0.1, 10%	189010A-4	
C64	1, 20%	189010A-5	
C65	240 pF, 1%	189018-16	CM05ED241J03
C66	10, 35V	189719A-9	Hilton SWT35Z10
C67	0.1, 10%	189010A-4	
C68	1, 20%	189010A-5	
C69	43 pF, 1%	189018-12	CM05ED430J03
C70	51 pF, 1%	189009-8	CM05ED510J03
C71	820 pF, 1%	89017-4	CM05ED821J03
C72	18 pF, 1%	189008-95	CM05ED180J03
C73	20 pF	189008A-5	CM05ED200J03
C74	0.1, 10%	189010A-4	
C75	1000 pF	189010A-1	
C76	270 pF, 1%	189018-5	CM05ED271J03
C77	47 pF, 1%	89018-50	CM05ED470J03
C78	240 pF, 1%	189018-16	CM05ED241J03
C80	20 pF	189008A-5	CM05ED200J03
C81	0.1, 10%	189010A-4	
C82	0.01, 10%	189010A-2	
C83	10, 35V	189719A-9	Hilton SWT35Z10
C84,C85,C86,C87	0.1, 10%	189010A-4	
C89	0.01, 10%	189010A-2	
C90	0.01, 1%	188212-87	
C91,C92,C93,C94,C95, C96,C97	0.1, 10%	189010A-4	
C98	470 pF, 1%	189008A-29	CM05ED471J0
C99	100 pF, 1%	189008-80	CM05ED101J03
C100,C101,C102	0.1, 10%	189010A-4	
C103	1000 pF	189010A-1	
C104	820 pF, 1%	189017-4	CM05ED821J03
C105	1000 pF, 5%	189008-89	
C106	470 pF	189008A-29	CM05ED471J03
C107,C108,C109,C110,C111	10, 35V	189719A-9	Hilton SWT35Z10
C112	1000 pF	189010A-1	
C113	10, 35V	189719A-9	Hilton SWT35Z10
C114,C115	0.01, 10%	189010A-2	
C116,C117	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C118,C119,C120	0.01, 10%	189010A-2	
C121	1, 20%	189010A-5	
C122,C123,C124,C125,C126, C127,C128,C129,C130	0.01, 10%	189010A-2	
C131	0.1, 10%	189010A-4	
C132	0.01, 10%	189010A-2	
C133,C134	0.1, 10%	189010A-4	
C135,C136	0.01, 10%	189010A-2	
C138	0.1, 10%	189010A-4	
C139,C140	0.01, 10%	189010A-2	
C141	1, 20%	189010A-5	
C142	0.01, 10%	189010A-2	
C143	1000 pF	189010A-1	
C144,C145,C146,C147,C148, C149,C150,C151,C152	0.01, 10%	189010A-2	
C153	10, 35V	189719A-9	Hilton SWT35Z10
C154	0.01, 10%	189010A-2	
C155	10, 35V	189719A-9	Hilton SWT35Z10
C156,C157	0.01, 10%	189010A-2	
C158	10, 35V	189719A-9	Hilton SWT35Z10
C159	0.01, 10%	189010A-2	
C160	10, 35V	189719A-9	Hilton SWT35Z10
C161	0.01, 10%	189010A-2	
C162	1000 pF	189010A-1	
C163	0.01, 10%	189010A-2	
C164,C165	1000 pF	189010A-1	
C166	0.01, 10%	189010A-2	
C167	1000 pF	189010A-1	
C168	10, 35V	189719A-9	Hilton SWT35Z10
C169	1000 pF	189010A-1	
C170	10, 35V	189719A-9	Hilton SWT35Z10
C171	1000 pF	189010A-1	
C172	0.01, 10%	189010A-2	
C173	1000 pF	189010A-1	
C174	10, 35V	189719A-9	Hilton SWT35Z10
C175	1000 pF	189010A-1	
C176	10, 35V	189719A-9	Hilton SWT35Z10
C177	220, 25V	89719A-75	Hilton SWT25Z220
C178	1, 20%	189010A-5	
C179	220, 25V	89719A-75	Hilton SWT25Z220
C180	0.1, 10%	189010A-4	
C182	220, 25V	89719A-75	Hilton SWT25Z22
C183	0.01, 10%	189010A-2	
C184	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C185	10, 35V	189719A-9	Hilton SWT35Z10
C186	0.1, 10%	189010A-4	
C187	68 pF	189008A-42	CM05ED680J03
C188	1000 pF	189010A-1	
C189,C190,C191,C192,C193, C194,C195	0.01, 10%	189010A-2	
C196	0.1, 10%	189010A-4	
C197	1, 20%	189010A-5	
C198	0.1, 10%	189010A-4	
C199	8.2, 15V, 20%	189765	Kemet K8R2W15
C200	10, 35V	189719A-9	
	DIODES		
CR1,CR2,CR3	1N914A	189405A	GE
CR4	1N823A	189437A	
CR5,CR6	1N914A	189405A	GE
CR7	BB505, BB121, or BB141	189439A-44	
CR8,CR9,CR10,CR11,CR12,CR13	1N914A	189405A	GE
CR14	MV209	189439-38	
CR15	1N914A	189405A	GE
CR17	BB505, BB121, or BB141	189439A-44	
CR18,CR19	1N6263	89440-86	
	LEDS		
DS1,DS2,DS3	LED	89904-45	
	PINS		
E1,E2,E3,E4,E5,E6,E7,E8,E9, E10,E11,E12,E13,E14,E15,E16, E17,E20,E21,E22,E23,E24, E30,E31,E32,E33,E34,E35, E36,E37,E38	Pin	188500-23	
	FUSES		
F1	2A, 250V Buss AGC	188200-2	
F2	0.5A, Buss AGC	188203	
F3	40 MHz Filter	1841578-2	
	CONNECTORS		
J1	F	189397-5	
J2	BNC	188357-48	
J3,J4	Pin	188500-29	
J5	D	89397-20	
	RELAYS		
K1	Relay	189800-28	Aromat RSD-5V

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2	2.5T	189162-31	
L3	1.5T Shielded	189162-36	
L4	0.56	189169A-57	
L5	1.2	189169A-65	
L6	0.56	189169A-57	
L7	3.3	189169A-31	
L8	Choke	189169-37	Ferroxcube VK200/3B-10
L9,L10	1	189169A-40	
L11	Choke	189169-37	Ferroxcube VK200/3B-10
L12	1.5T Unshielded	189162-89	
L14	Choke	189169-37	Ferroxcube VK200/3B-10
L16	1.2	189169A-65	
L17	1.8	189169A-56	
L18	200, 5%	187293	Delvan 1537
L19	14-1/2T	89162-64	Coilcraft T7-143
L20	11-1/2T	89162-63	Coilcraft T7-143
L21,L22,L23,L24,L25,L26,L27	Choke	189169-37	Ferroxcube VK200/3B-10
L28	22	189161A-1	
L29,L30	Choke	189169-37	Ferroxcube VK200/3B-10
	MIXERS		
M1,M2,M3,M4,M5,M6	SBL1	89887-3	
	TRANSISTORS		
Q1	2N3904	189700A	Motorola
Q2,Q5	3SK121	189888-53	
Q6	NE41632B	189888-39	
Q7,Q8	MPS918	189774A	
Q9	2N3904	189700A	Motorola
Q10	2N3906	189727A	Motorola
Q11,Q12	VN10KM	89888-70	
Q13	2N3904	189700A	Motorola
Q14,Q15	NE41632B	189888-39	
Q16	2N3904	189700A	Motorola
Q17,Q18	PN4258		
Q19	2N3904	189888-50	Motorola
Q20	U310	187223-75	Unitrode
Q21	2N3904	189700A	Motorola
Q22	U310	187223-75	Unitrode

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
Q23,Q24	PN4258	189888-50	
Q25	2N3904	189700A	Motorola
Q26	2N3906	189727A	Motorola
Q27,Q28	2N3904	189700A	Motorola

RESISTORS

All resistors are in 1/4W 5% ohms unless otherwise specified.

R1	10	189231A	RC07GF100J
R3	68	189482A	RC07GF680J
R4	560	189235A	RC07GF561J
R5	100	189202A	RC07GF101J
R6,R7	300	189486A	RC07GF301J
R8	75	189280A	RC07GF750J
R9	11K	189238A-35	RC07GF113J
R10	910	189200A-19	
R11	10	189231A	RC07GF100J
R12,R13	10K	189227A	RC07GF103J
R15	510	189481A-19	RC07GF511J
R20	390	189180A	RC07GF391J
R21	110K	189238A-58	RC07GF114J
R22	39K	189494A	RC07GF393J
R23	30K	189481A-25	RC07GF303J
R24	330	189205A	RC07GF331J
R25	33	189478A	RC07GF330J
R26	68	189482A	RC07GF680J
R27	150	189204A	RC07GF151J
R28,R29	100K	189278A	RC07GF104J
R30	3.9K	189224A	RC07GF392J
R31	2.7K	189181A	RC07GF272J
R32	620	189200A-10	RC07GF621J
R33	22K	189228A	RC07GF223J
R38	150	189204A	RC07GF151J
R39	510	189481A-19	RC07GF511J
R41	300	189486A	RC07GF301J
R42,R43,R44	510	189481A-19	RC07GF511J
R45	220	189233A	RC07GF221J
R46	150	189204A	RC07GF151J
R47	68	189482A	RC07GF680J
R48	330	189205A	RC07GF331J
R49	68	189482A	RC07GF680J
R50	200	189484A	RC07GF201J
R51	510	189481A-19	RC07GF511J
R52	2.4K	189489A	RC07GF242J
R53	910	189200A-19	RC07GF911J
R54	1K	189220A	RC07GF101J
R55,R56,R57,R58	270	189485A	RC07GF271J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R59,R60,R61,R62	33	189478A	RC07GF330J
R63,R64	150	189204A	RC07GF151J
R65	1K	189220A	RC07GF101J
R66	1.2K	189221A	RC07GF122J
R67	1.8K	188248A	RC07GF182J
R68,R69	150	189204A	RC07GF151J
R70,R71	75	189280A	RC07GF750J
R72,R73,R74,R75	15.8K, 1/8W, 1%	188272A	RN55D15R8F
R76	1K, 1/8W, 1%	187460A	RN55D1001F
R77	200, 1/8W, 1%	189327A-62	RN55D2001F
R78	1M, 1/8W, 1%	188541A-34	RN55D1005F
R79	1K	189220A	RC07GF101J
R80	24K	189481A-14	RC07GF243J
R81	1.1K	189200A-27	RC07GF112J
R82	2K	189488A	RC07GF201J
R83	130	189200A-17	RC07GF131J
R84	10K	189227A	RC07GF103J
R85	2K	189488A	RC07GF201J
R86	3.9K	189224A	RC07GF392J
R87	1K	189220A	RC07GF101J
R88	820	189207A	RC07GF821J
R89,R90,R91,R92	2K	189488A	RC07GF201J
R93	1K	189220A	RC07GF101J
R94	5.1K	189491A	RC07GF512J
R95	3K	189490A	RC07GF301J
R96,R97	56	189232A	RC07GF560J
R98	20K	189200A-14	RC07GF203J
R100	620	189200A-10	RC07GF621J
R101	15	189239A	RC07GF150J
R102	330	189205A	RC07GF331J
R103	39	189480A	RC07GF390J
R104	510	189481A-19	RC07GF511J
R105	220	189233	RC07GF221J
R106	56	189232	RC07GF560J
R107	220	189233	RC07GF221J
R108	Potentiometer, 200	188453-43	Bourns
R109	2K	189488A	RC07GF201J
R110	330	189205A	RC07GF331J
R111	1.2K	189221A	RC07GF122J
R113,R114	604, 1/8W, 1%	189256-33	RN55D604RF
R115	464, 1/8W, 1%	187461	RN55D464RF
R116	330	189205A	RC07GF331J
R117	240	189200A-4	RC07GF241J
R118	1.07K, 1/8W, 1%	189262A-28	RN55D1R07F
R119	523, 1/8W, 1%	189327-39	RN55D523RF

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R120	1.21K, 1/8W, 1%	189256-13	RN55D1R21F
R121	215, 1/8W, 1%	189256A-7	RN55D215RF
R122	374, 1/8W, 1%	189327A-37	RN55D374RF
R123	215, 1/8W, 1%	189256A-7	RN55D215RF
R124,R125	523, 1/8W, 1%	189327-39	RN55D523RF
R126,R127	100	189202A	RC07GF101J
R128	330	189205A	RC07GF331J
R129,R130	1K	189220A	RC07GF101J
R131	100	189202A	RC07GF101J
R132	330	189205A	RC07GF331J
R133	374, 1/8W, 1%	189327A-37	RN55D374RF
R134	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R135	7.87K	189481A-36	RN55D7R87F
R136	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R137	75, 1/8W, 1%	187456A	RN55D75R0F
R138,R139	130, 1/8W, 1%	189327A-27	RN55D131J
R140	1.1K	189200A-27	RC07GF112J
R141	110	189483A	RC07GF111J
R142	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R143,R144	10K, 1/8W, 1%	189326A	RN55D1003F
R145	1K	189220A	RC07GF101J
R146	17.8, 1/8W, 1%	89262-18	RN55D17R8F
R147	75, 1/8W, 1%	187456A	RN55D75R0F
R148,R149	1M	189238A-30	RC07GF105J
R150	2K	189488A	RC07GF201J
R151	510	189481A-19	RC07GF511J
R152	430	189238A-31	RC07GF431J
R153	820	189207A	RC07GF821J
R154	6.2K	189200A-5	RC07GF622J
R155	5.1K	189491A	RC07GF512J
R156	6.2K	189200A-5	RC07GF622J
R157,R158,R159,R160	150	189204A	RC07GF151J
R161,R162	24	189238A-20	RC07GF240J
R163	390	189180A	RC07GF391J
R165,R166	33	189478A	RC07GF330J
R167,R168	270	189485A	RC07GF271J
R169	33	189478A	RC07GF330J
R170	270	189485A	RC07GF271J
R171,R172	75	189280A	RC07GF750J
R173,R174	15.8K, 1/8W, 1%	188272A	RN55D15R8F

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R175,R176	4.22K, 1/8W, 1%	89331	RN55D4R22F
R177	270	189485A	RC07GF271J
R178	33	189478A	RC07GF330J
R179	6.98K, 1/8W, 1%	89262-35	RN55D6R98F
R180	402K, 1/8W, 1%	188541A-54	RN55D402RF
R181	10K	189227A	RC07GF103J
R182,R183	2K	189488A	RC07GF201J
R184	130	189200A-17	RC07GF131J
R185	3.01K, 1/8W, 1%	188541A-59	RN55D3R01F
R186	1.5K, 1/8W, 1%	189256A-16	RN55D1R50F
R187	3K	189490A	RC07GF301J
R188	9.1K	189200A-12	RC07GF912J
R189	1M, 1/8W, 1%	188541A-34	RN55D1005F
R190	3K	189490A	RC07GF301J
R191	9.1K	189200A-12	RC07GF912J
R192,R193,R194,R195	2K	189488A	RC07GF201J
R196	1K, 1/8W, 1%	187460A	RN55D1001F
R197	1M	189238A-30	RC07GF105J
R199	75	189280A	RC07GF750J
R200	150	189204A	RC07GF151J
R201	470	189234A	RC07GF471J
R202,R203,R204	2K	189488A	RC07GF201J
R205	12, 1W, 5%	188539A-84	
R206	68K	189276A	RC07GF683J
R207	2.7	189481A-13	
R208,R209,R210,R211,R212, R213,R214	1K	189220A	RC07GF101J
R215	510	189481A-19	RC07GF511J
R216	82.5, 1/8W, 1%	187457A	RN55D82R5F
R217	200, 1/8W, 1%	189327A-62	RN55D2001F
R218	Potentiometer, 50K	188453-40	Bourns
R219	82.5, 1/8W, 1%	187457A	RN55D82R5F
R220	200, 1/8W, 1%	189327A-62	RN55D2001F
R221	Potentiometer, 50K	188453-40	Bourns
R222	160, 1/8W, 5%	189262-23	RN55D161RF
R224	1K, 1/8W, 1%	187460A	RN55D1001F
R225	4.42K, 1/8W, 1%	189256A-88	RN55D4R42F
R226	6.81K, 1/8W, 1%	189316A	RN55D6R81F
R227	15	189239A	RC07GF150J
R228	10	189231A	RC07GF100J
R229	2K	189488A	RC07GF201J
R232,R233,R234	1K	189220A	RC07GF101J
R235	1.82K, 1/8W, 1%	188541A-10	RN55D1R82F
R236	10K	189227A	RC07GF103J
R238	1.2K	189221A	RC07GF122J
R239	1K	189220A	RC07GF101J
R240	100	189202A	RC07GF101J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	RESISTOR NETWORKS		
RN2,RN3	10K, 1%	188540-32	4114R-001
	TRANSFORMERS		
T1	Transformer	1841877-1	
T2	Transformer	1840056-2	
	TERMINAL BLOCKS		
TB1	3 Position	189892-24	
TB3	4 Position	189892-25	
	TESTPOINTS		
TP1,TP2,TP3,TP4,TP5	White	188500-19	
TP6	Black	188500-20	
	INTEGRATED CIRCUITS		
U1	78MGU	189889-82	
U2	LF353N	189889-95	
U3	10H116	189975-25	
U4	10131	189976-34	
U5	TL084	189976-96	
U6	74LS01	189976-65	
U7	LM311	189889-11	
U8	LM319N	189975-24	
U9,U10	733	189889-76	
U11,U12	AM687	189976-66	
U13,U14	10131	189976-34	
U15	10102	189976-33	
U16	LF353N	189889-95	
U17	10125	189975-67	
U18	74HC132	89974-33	
U19	10131	189976-34	
U20	TL084	189976-96	
U21	LM311	189889-11	
U22	LM319N	189975-24	
U23	74LS01	189976-65	
U24	MC1648P	189889-8	
U25	LM317L	189975-69	
U26	78M12T	189889-25	
U27	MC7912 Voltage Regulator	89976-67	
U28	79M05T	189889-91	
U29	7805T	189975-72	
U30	LM317T	189889-62	
U31	AM687	189976-66	
U32	MC1648P	189889-8	
U33	MWA130 Hybrid Amp	189889-72	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	VARISTORS		
VR1,VR2	Varistor	189195-1	GE V47ZA7
	SHORTING PLUGS		
W1,W2,W3,W4,W5,W6,W7	Shorting Plug	188500-23	
	CRYSTALS		
Y1	10.000 MHz	189526-17	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RECEIVER BASEBAND BOARD PWB ASSEMBLY PN 1841562-3			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2	15 pF	189117A	CM05ED150J03
C3	12 pF	189085A	CM05ED120J03
C4,C5	1000 pF	189010A-1	
C6	33 pF	189139A	CM05ED330J03
C7	1000 pF	189010A-1	
C8	33 pF	189139A	CM05ED330J03
C9,C10	0.01, 10%	189010A-2	
C12	10, 35V	189719A-9	Hilton SWT35Z10
C13	1000 pF	189010A-1	
C14	0.1, 10%	189010A-4	
C15	1000 pF	189010A-1	
C16,C17	10, 35V	189719A-9	Hilton SWT35Z10
C18	0.01, 10%	189010A-2	
C20	10, 35V	189719A-9	Hilton SWT35Z10
C21	1000 pF	189010A-1	
C22,C23	0.01, 10%	189010A-2	
C24	510 pF	189017A-51	CM05ED511J03
C25	1000 pF	189010A-1	
C26,C27,C28	0.01, 10%	189010A-2	
C29	1000 pF	189010A-1	
C30	0.1, 10%	189010A-4	
C31	1000 pF	189010A-1	
C32,C33,C34,C35	0.1, 10%	189010A-4	
C36,C37	0.01, 10%	189010A-2	
C38	0.1, 10%	189010A-4	
C39,C40,C41,C42,C43	0.01, 10%	189010A-2	
C44,C45	62 pF	189008A-71	CM05ED620J03
C46	0.1, 10%	189010A-4	
C47	100 pF	189086A	CM05ED101J03
C48	0.1, 10%	189010A-4	
C49	6 $\pm$ 0.5 pF	89017A-53	
C50	8 pF	189008A-86	CM05ED080J03
C51,C52	1000 pF	189010A-1	
C53,C54	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C55	18 pF	189008A-95	
C56	0.01, 10%	189010A-2	
C57	82 pF	189081A	CM05ED820J03
C58	12 pF	189085A	CM05ED120J03
C59	300 pF	189017A-52	CM05ED301J03
C60	3 pF	189079A	CM05ED030J03
C61	270 pF	189141A	CM05ED271J03
C62	10, 35V	189719A-9	Hilton SWT35Z10
C63	0.1, 10%	189010A-4	
C64	1, 20%	189010A-5	
C65	100 pF, 1%	189008-80	CM05ED101J03
C66	10, 35V	189719A-9	Hilton SWT35Z10
C67	0.1, 10%	189010A-4	
C68	1, 20%	189010A-5	
C69	36 pF, 1%	189009-5	CM05ED360J03
C70	22 pF, 1%	189008-97	CM05ED220J03
C71	510 pF, 1%	188214-41	CM05ED511J03
C72	15 pF, 1%	189008-94	CM05ED150J03
C73	20 pF	189008A-5	CM05ED200J03
C74	0.1, 10%	189010A-4	
C75	1000 pF	189010A-1	
C76	180 pF, 1%	189008-82	CM05ED181J03
C77	24 pF, 1%	189018-10	CM05ED240J03
C78	130 pF, 1%	189008-69	CM05ED130J03
C79	36 pF, 1%	189009-5	CM05ED360J03
C80	20 pF	189008A-5	CM05ED200J03
C81	0.1, 10%	189010A-4	
C82	0.01, 10%	189010A-2	
C83	10, 35V	189719A-9	Hilton SWT35Z10
C84,C85,C86,C87	0.1, 10%	189010A-4	
C88	2200 pF	89018-55	
C89	0.01, 10%	189010A-2	
C90	2200 pF	89018-55	
C91,C92,C93,C94,C95, C96,C97	0.1, 10%	189010A-4	
C98	470 pF, 1%	189008A-29	CM05ED471J0
C99	270 pF, 1%	189018-5	CM05ED271J03
C100,C101,C102	0.1, 10%	189010A-4	
C103	1000 pF	189010A-1	
C104	430 pF, 1%	189010A-18	CM05ED431J03
C105	20 pF, 1%	89018-49	CM05ED200J03
C106	470 pF	189008A-29	CM05ED471J03
C107,C108,C109,C110,C111	10, 35V	189719A-9	Hilton SWT35Z10
C112	1000 pF	189010A-1	
C113	10, 35V	189719A-9	Hilton SWT35Z10
C114,C115	0.01, 10%	189010A-2	
C116,C117	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C118,C119,C120	0.01, 10%	189010A-2	
C121	1, 20%	189010A-5	
C122,C123,C124,C125,C126, C127,C128,C129,C130	0.01, 10%	189010A-2	
C131	0.1, 10%	189010A-4	
C132	0.01, 10%	189010A-2	
C133,C134	0.1, 10%	189010A-4	
C135,C136	0.01, 10%	189010A-2	
C138	0.1, 10%	189010A-4	
C139,C140	0.01, 10%	189010A-2	
C141	1, 20%	189010A-5	
C142	0.01, 10%	189010A-2	
C143	1000 pF	189010A-1	
C144,C145,C146,C147,C148, C149,C150,C151,C152	0.01, 10%	189010A-2	
C153	10, 35V	189719A-9	Hilton SWT35Z10
C154	0.01, 10%	189010A-2	
C155	10, 35V	189719A-9	Hilton SWT35Z10
C156,C157	0.01, 10%	189010A-2	
C158	10, 35V	189719A-9	Hilton SWT35Z10
C159	0.01, 10%	189010A-2	
C160	10, 35V	189719A-9	Hilton SWT35Z10
C161	0.01, 10%	189010A-2	
C162	1000 pF	189010A-1	
C163	0.01, 10%	189010A-2	
C164,C165	1000 pF	189010A-1	
C166	0.01, 10%	189010A-2	
C167	1000 pF	189010A-1	
C168	10, 35V	189719A-9	Hilton SWT35Z10
C169	1000 pF	189010A-1	
C170	10, 35V	189719A-9	Hilton SWT35Z10
C171	1000 pF	189010A-1	
C172	0.01, 10%	189010A-2	
C173	1000 pF	189010A-1	
C174	10, 35V	189719A-9	Hilton SWT35Z10
C175	1000 pF	189010A-1	
C176	10, 35V	189719A-9	Hilton SWT35Z10
C177	220, 25V	89719A-75	Hilton SWT25Z220
C178	1, 20%	189010A-5	
C179	220, 25V	89719A-75	Hilton SWT25Z220
C180	0.1, 10%	189010A-4	
C182	220, 25V	89719A-75	Hilton SWT25Z22
C183	0.01, 10%	189010A-2	
C184	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C185	10, 35V	189719A-9	Hilton SWT35Z10
C186	0.1, 10%	189010A-4	
C187	68 pF	189008A-42	CM05ED680J03
C188	1000 pF	189010A-1	
C189,C190,C191,C192,C193, C194,C195	0.01, 10%	189010A-2	
C196	0.1, 10%	189010A-4	
C197	1, 20%	189010A-5	
C198	0.1, 10%	189010A-4	
C199	8.2, 15V, 20%	89765	Kemet K8R2W15
C200	10, 35V	189719A-9	
	DIODES		
CR1,CR2,CR3	1N914A	189405A	GE
CR4	1N823A	189437A	
CR5,CR6	1N914A	189405A	GE
CR7	BB505, BB121, or BB141	189439A-44	
CR8,CR9,CR10,CR11,CR12,CR13	1N914A	189405A	GE
CR14	MV209	189439-38	
CR15	1N914A	189405A	GE
CR17	BB505, BB121, or BB141	189439A-44	
CR18,CR19	1N6263	89440-86	
	LEDS		
DS1,DS2,DS3	LED	89904-45	
	PINS		
E1,E2,E3,E4,E5,E6,E7,E8,E9, E10,E11,E12,E13,E14,E15,E16, E17,E20,E21,E22,E23,E24, E30,E31,E32,E33,E34,E35, E36,E37,E38	Pin	188500-23	
	FUSES		
F1	2A, 250V Buss AGC	188200-2	
F2	0.5A, Buss AGC	188203	
F3	40 MHz Filter	1841578-3	
	CONNECTORS		
J1	F	189397-5	
J2	BNC	188357-48	
J3,J4	Pin	188500-29	
J5	D	89397-20	
	RELAYS		
K1	Relay	189800-28	Aromat RSD-5V

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2	2.5T	189162-31	
L3	1.5T Shielded	189162-36	
L4	0.56	189169A-57	
L5	1.2	189169A-65	
L6	0.56	189169A-57	
L7	3.3	189169A-31	
L8	Choke	189169-37	Ferroxcube VK200/3B-10
L9,L10	1	189169A-40	
L11	Choke	189169-37	Ferroxcube VK200/3B-10
L12	1.5T Unshielded	189162-89	
L14	Choke	189169-37	Ferroxcube VK200/3B-10
L16	1.2	189169A-65	
L17	1.8	189169A-56	
L18	200, 5%	187293	Delvan 1537
L19	14-1/2T	89162-64	Coilcraft T7-143
L20	9-1/2T	89162-46	Coilcraft T7-143
L21,L22,L23,L24,L25,L26,L27	Choke	189169-37	Ferroxcube VK200/3B-10
L28	22	189161A-1	
L29,L30	Choke	189169-37	Ferroxcube VK200/3B-10
	MIXERS		
M1,M2,M3,M4,M5,M6	SBL1	89887-3	
	TRANSISTORS		
Q1	2N3904	189700A	Motorola
Q2,Q5	3SK121	189888-53	
Q6	NE41632B	189888-39	
Q7,Q8	MPS918	189774A	
Q9	2N3904	189700A	Motorola
Q10	2N3906	189727A	Motorola
Q11,Q12	VN10KM	89888-70	
Q13	2N3904	189700A	Motorola
Q14,Q15	NE41632B	189888-39	
Q16	2N3904	189700A	Motorola
Q17,Q18	PN4258	189888-50	
Q19	2N3904	189700A	Motorola
Q20	U310	187223-75	Unitrode
Q21	2N3904	189700A	Motorola
Q22	U310	187223-75	Unitrode

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
Q23,Q24	PN4258	189888-50	
Q25	2N3904	189700A	Motorola
Q26	2N3906	189727A	Motorola
Q27,Q28	2N3904	189700A	Motorola

RESISTORS

All resistors are in 1/4W 5% ohms unless otherwise specified.

R1	10	189231A	RC07GF100J
R3	68	189482A	RC07GF680J
R4	560	189235A	RC07GF561J
R5	100	189202A	RC07GF101J
R6,R7	300	189486A	RC07GF301J
R8	75	189280A	RC07GF750J
R9	11K	189238A-35	RC07GF113J
R10	910	189200A-19	
R11	10	189231A	RC07GF100J
R12,R13	10K	189227A	RC07GF103J
R15	510	189481A-19	RC07GF511J
R20	390	189180A	RC07GF391J
R21	110K	189238A-58	RC07GF114J
R22	39K	189494A	RC07GF393J
R23	30K	189481A-25	RC07GF303J
R24	330	189205A	RC07GF331J
R25	33	189478A	RC07GF330J
R26	68	189482A	RC07GF680J
R27	150	189204A	RC07GF151J
R28,R29	100K	189278A	RC07GF104J
R30	3.9K	189224A	RC07GF392J
R31	2.7K	189181A	RC07GF272J
R32	620	189200A-10	RC07GF621J
R33	22K	189228A	RC07GF223J
R38	150	189204A	RC07GF151J
R39	510	189481A-19	RC07GF511J
R41	300	189486A	RC07GF301J
R42,R43,R44	510	189481A-19	RC07GF511J
R45	220	189233A	RC07GF221J
R46	150	189204A	RC07GF151J
R47	68	189482A	RC07GF680J
R48	330	189205A	RC07GF331J
R49	68	189482A	RC07GF680J
R50	200	189484A	RC07GF201J
R51	510	189481A-19	RC07GF511J
R52	2.4K	189489A	RC07GF242J
R53	910	189200A-19	RC07GF911J
R54	1K	189220A	RC07GF101J
R55,R56,R57,R58	270	189485A	RC07GF271J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R59,R60,R61,R62	33	189478A	RC07GF330J
R63,R64	150	189204A	RC07GF151J
R65	1K	189220A	RC07GF101J
R66	1.2K	189221A	RC07GF122J
R67	1.8K	188248A	RC07GF182J
R68,R69	150	189204A	RC07GF151J
R70,R71	75	189280A	RC07GF750J
R72,R73,R74,R75	15.8K, 1/8W, 1%	188272A	RN55D15R8F
R76	1K, 1/8W, 1%	187460A	RN55D1001F
R77	200, 1/8W, 1%	189327A-62	RN55D2001F
R78	1M, 1/8W, 1%	188541A-34	RN55D1005F
R79	1K	189220A	RC07GF101J
R80	24K	189481A-14	RC07GF243J
R81	1.1K	189200A-27	RC07GF112J
R82	2K	189488A	RC07GF201J
R83	130	189200A-17	RC07GF131J
R84	10K	189227A	RC07GF103J
R85	2K	189488A	RC07GF201J
R86	3.9K	189224A	RC07GF392J
R87	1K	189220A	RC07GF101J
R88	820	189207A	RC07GF821J
R89,R90,R91,R92	2K	189488A	RC07GF201J
R93	1K	189220A	RC07GF101J
R94	5.1K	189491A	RC07GF512J
R95	3K	189490A	RC07GF301J
R96,R97	56	189232A	RC07GF560J
R98	20K	189200A-14	RC07GF203J
R100	620	189200A-10	RC07GF621J
R101	15	189239A	RC07GF150J
R102	330	189205A	RC07GF331J
R103	39	189480A	RC07GF390J
R104	510	189481A-19	RC07GF511J
R105	180	18900-3	RC07GF181J
R106	75	189280	RC07GF750J
R107	180	18900-3	RC07GF181J
R108	Potentiometer, 200	188453-43	Bourns
R109	2K	189488A	RC07GF201J
R110	330	189205A	RC07GF331J
R111	1.2K	189221A	RC07GF122J
R113,R114	604, 1/8W, 1%	189256-33	RN55D604RF
R115	715, 1/8W, 1%	89262-25	RN55D715RF
R116	330	189205A	RC07GF331J
R117	240	189200A-4	RC07GF241J
R118	1.07K, 1/8W, 1%	189262A-28	RN55D1R07F
R119	523, 1/8W, 1%	189327-39	RN55D523RF

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R120	1.21K, 1/8W, 1%	189256-13	RN55D1R21F
R121	215, 1/8W, 1%	189256A-7	RN55D215RF
R122	374, 1/8W, 1%	189327A-37	RN55D374RF
R123	215, 1/8W, 1%	189256A-7	RN55D215RF
R124,R125	523, 1/8W, 1%	189327-39	RN55D523RF
R126,R127	100	189202A	RC07GF101J
R128	330	189205A	RC07GF331J
R129,R130	1K	189220A	RC07GF101J
R131	100	189202A	RC07GF101J
R132	330	189205A	RC07GF331J
R133	374, 1/8W, 1%	189327A-37	RN55D374RF
R134	1.21K, 1/8W, 1%	188541A-35	
R135	7.87K	189481A-36	RN55D7R87F
R136	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R137	75, 1/8W, 1%	187456A	RN55D75R0F
R138,R139	130, 1/8W, 1%	189200A-14	RN55D131J
R140	1.1K	189200A-27	RC07GF112J
R141	110	189483A	RC07GF111J
R142	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R143,R144	10K, 1/8W, 1%	189326A	RN55D1003F
R145	1K	189220A	RC07GF101J
R146	29.4, 1/8W, 1%	89262-20	RN55D29R4F
R147	75, 1/8W, 1%	187456A	RN55D75R0F
R148,R149	1M	189238A-30	RC07GF105J
R150	2K	189488A	RC07GF201J
R151	510	189481A-19	RC07GF511J
R152	430	189238A-31	RC07GF431J
R153	820	189207A	RC07GF821J
R154	6.2K	189200A-5	RC07GF622J
R155	5.1K	189491A	RC07GF512J
R156	6.2K	189200A-5	RC07GF622J
R157,R158,R159,R160	150	189204A	RC07GF151J
R161,R162	24	189238A-20	RC07GF240J
R163	390	189180A	RC07GF391J
R165,R166	33	189478A	RC07GF330J
R167,R168	270	189485A	RC07GF271J
R169	33	189478A	RC07GF330J
R170	270	189485A	RC07GF271J
R171,R172	75	189280A	RC07GF750J
R173,R174	15.8K, 1/8W, 1%	188272A	RN55D15R8F

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R175,R176	5.32K, 1/8W, 1%	89327-95	RN55D5R32F
R177	270	189485A	RC07GF271J
R178	33	189478A	RC07GF330J
R179	4.99K, 1/8W, 1%	89256-93	RN55D4R99F
R180	402K, 1/8W, 1%	188541A-54	RN55D402RF
R181	10K	189227A	RC07GF103J
R182,R183	2K	189488A	RC07GF201J
R184	130	189200A-17	RC07GF131J
R185	3.01K, 1/8W, 1%	188541A-59	RN55D3R01F
R186	1.5K, 1/8W, 1%	189256A-16	RN55D1R50F
R187	3K	189490A	RC07GF301J
R188	9.1K	189200A-12	RC07GF912J
R189	1M, 1/8W, 1%	188541A-34	RN55D1005F
R190	3K	189490A	RC07GF301J
R191	9.1K	189200A-12	RC07GF912J
R192,R193,R194,R195	2K	189488A	RC07GF201J
R196	1K, 1/8W, 1%	187460A	RN55D1001F
R197	1M	189238A-30	RC07GF105J
R199	75	189280A	RC07GF750J
R200	150	189204A	RC07GF151J
R201	470	189234A	RC07GF471J
R202,R203,R204	2K	189488A	RC07GF201J
R205	12, 1W, 5%	188539A-84	
R206	68K	189276A	RC07GF683J
R207	2.7	189481A-13	
R208,R209,R210,R211,R212, R213,R214	1K	189220A	RC07GF101J
R215	510	189481A-19	RC07GF511J
R216	82.5, 1/8W, 1%	187457A	RN55D82R5F
R217	200, 1/8W, 1%	189327A-62	RN55D2001F
R218	Potentiometer, 50K	188453-40	Bourns
R219	82.5, 1/8W, 1%	187457A	RN55D82R5F
R220	200, 1/8W, 1%	189327A-62	RN55D2001F
R221	Potentiometer, 50K	188453-40	Bourns
R222	160, 1/8W, 5%	189262-23	
R224	1K, 1/8W, 1%	187460A	RN55D1001F
R225	4.42K, 1/8W, 1%	189256A-88	RN55D4R42F
R226	6.81K, 1/8W, 1%	189316A	RN55D6R81F
R227	15	189239A	RC07GF150J
R228	10	189231A	RC07GF100J
R229	2K	189488A	RC07GF201J
R230	6.04K, 1/8W, 1%	189256-84	RC07GF6R04F
R231	1.07K, 1/8W, 1%	89262-28	RN55D1R07F
R232,R233,R234	1K	189220A	RC07GF101J
R235	1.82K, 1/8W, 1%	188541A-10	RN55D1R82F
R236	10K	189227A	RC07GF103J
R238	1.2K	189221A	RC07GF122J
R239	1K	189220A	Rc07GF101J
R240	100	189202A	RC07GF101J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	RESISTOR NETWORKS		
RN2,RN3	10K, 1%	188540-32	4114R-001
	TRANSFORMERS		
T1	Transformer	1841877-1	
T2	Transformer	1840056-2	
	TERMINAL BLOCKS		
TB1	3 Position	189892-24	
TB3	4 Position	189892-25	
	TESTPOINTS		
TP1,TP2,TP3,TP4,TP5	White	188500-19	
TP6	Black	188500-20	
	INTEGRATED CIRCUITS		
U1	78MGU	189889-82	
U2	LF353N	189889-95	
U3	10H116	189975-25	
U4	10131	189976-34	
U5	TL084	189976-96	
U6	74LS01	189976-65	
U7	LM311	189889-11	
U8	LM319N	189975-24	
U9,U10	733	189889-76	
U11,U12	AM687	189976-66	
U13,U14	10131	189976-34	
U15	10102	189976-33	
U16	LF353N	189889-95	
U17	10125	189975-67	
U18	74HC132	89974-33	
U19	10131	189976-34	
U20	TL084	189976-96	
U21	LM311	189889-11	
U22	LM319N	189975-24	
U23	74LS01	189976-65	
U24	MC1648P	189889-8	
U25	LM317L	189975-69	
U26	78M12T	189889-25	
U27	MC7912 Voltage Regulator	89976-67	
U28	79M05T	819889-91	
U29	7805T	189975-72	
U30	LM317T	189889-62	
U31	AM687	189976-66	
U32	MC1648P	189889-8	
U33	MWA130 Hybrid Amp	189889-72	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	VARISTORS		
VR1,VR2	Varistor	189195-1	GE V47ZA7
	SHORTING PLUGS		
W1,W2,W3,W4,W5,W6,W7	Shorting Plug	188500-23	
	CRYSTALS		
Y1	10.000 MHz	189526-17	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RECEIVER BASEBAND BOARD PWB ASSEMBLY PN 1841562-4			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2	15 pF	189117A	CM05ED150J03
C3	12 pF	189085A	CM05ED120J03
C4,C5	1000 pF	189010A-1	
C6	33 pF	189139A	CM05ED330J03
C7	1000 pF	189010A-1	
C8	33 pF	189139A	CM05ED330J03
C9,C10	0.01, 10%	189010A-2	
C12	10, 35V	189719A-9	Hilton SWT35Z10
C13	1000 pF	189010A-1	
C14	0.1, 10%	189010A-4	
C15	1000 pF	189010A-1	
C16,C17	10, 35V	189719A-9	Hilton SWT35Z10
C18	0.01, 10%	189010A-2	
C20	10, 35V	189719A-9	Hilton SWT35Z10
C21	1000 pF	189010A-1	
C22,C23	0.01, 10%	189010A-2	
C24	510 pF	189017A-51	CM05ED511J03
C25	1000 pF	189010A-1	
C26,C27,C28	0.01, 10%	189010A-2	
C29	1000 pF	189010A-1	
C30	0.1, 10%	189010A-4	
C31	1000 pF	189010A-1	
C32,C33,C34,C35	0.1, 10%	189010A-4	
C36,C37	0.01, 10%	189010A-2	
C38	0.1, 10%	189010A-4	
C39,C40,C41,C42,C43	0.01, 10%	189010A-2	
C44,C45	62 pF	189008A-71	CM05ED620J03
C46	0.1, 10%	189010A-4	
C47	100 pF	189086A	CM05ED101J03
C48	0.1, 10%	189010A-4	
C49	6 ± 0.5 pF	89017A-53	
C50	8 pF	189008A-86	CM05ED080J03
C51,C52	1000 pF	189010A-1	
C53,C54	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C55	18 pF	189008A-95	
C56	0.01, 10%	189010A-2	
C57	82 pF	189081A	CM05ED820J03
C58	12 pF	189085A	CM05ED120J03
C59	300 pF	189017A-52	CM05ED301J03
C60	3 pF	189079A	CM05ED030J03
C61	270 pF	189141A	CM05ED271J03
C62	10, 35V	189719A-9	Hilton SWT35Z10
C63	0.1, 10%	189010A-4	
C64	1, 20%	189010A-5	
C65	43 pF, 1%	189018-12	CM05ED430J03
C66	10, 35V	189719A-9	Hilton SWT35Z10
C67	0.1, 10%	189010A-4	
C68	1, 20%	189010A-5	
C69	27 pF, 1%	189009-2	CM05ED270J03
C70	12 pF, 1%	189018-9	CM05ED120J03
C71	43 pF, 1%	189018-12	CM05ED430J03
C72	330 pF, 1%	189018-6	CM05ED331J03
C73	20 pF	189008A-5	CM05ED200J03
C74	0.1, 10%	189010A-4	
C75	1000 pF	189010A-1	
C76	100 pF, 1%	189008-80	CM05ED101J03
C77	20 pF, 1%	89018-49	CM05ED200J03
C78	82 pF, 1%	189008-72	CM05ED820J03
C79	15 pF, 1%	189008-94	CM05ED150J03
C80	20 pF	189008A-5	CM05ED200J03
C81	0.1, 10%	189010A-4	
C82	0.01, 10%	189010A-2	
C83	10, 35V	189719A-9	Hilton SWT35Z10
C84,C85,C86,C87	0.1, 10%	189010A-4	
C88	820 pF	189017-4	CM05ED821J03
C89	0.01, 10%	189010A-2	
C90	430 pF	189018-18	CM05ED431J03
C91,C92,C93,C94,C95, C96,C97	0.1, 10%	189010A-4	
C98	470 pF, 1%	189008A-29	CM05ED471J0
C99	270 pF, 1%	189018-5	CM05ED271J03
C100,C101,C102	0.1, 10%	189010A-4	
C103	1000 pF	189010A-1	
C104	430 pF, 1%	189010A-18	CM05ED431J03
C105	36 pF, 1%	189009-5	CM05ED360J03
C106	470 pF	189008A-29	CM05ED471J03
C107,C108,C109,C110,C111	10, 35V	189719A-9	Hilton SWT35Z10
C112	1000 pF	189010A-1	
C113	10, 35V	189719A-9	Hilton SWT35Z10
C114,C115	0.01, 10%	189010A-2	
C116,C117	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C118,C119,C120	0.01, 10%	189010A-2	
C121	1, 20%	189010A-5	
C122,C123,C124,C125,C126, C127,C128,C129,C130	0.01, 10%	189010A-2	
C131	0.1, 10%	189010A-4	
C132	0.01, 10%	189010A-2	
C133,C134	0.1, 10%	189010A-4	
C135,C136	0.01, 10%	189010A-2	
C138	0.1, 10%	189010A-4	
C139,C140	0.01, 10%	189010A-2	
C141	1, 20%	189010A-5	
C142	0.01, 10%	189010A-2	
C143	1000 pF	189010A-1	
C144,C145,C146,C147,C148, C149,C150,C151,C152	0.01, 10%	189010A-2	
C153	10, 35V	189719A-9	Hilton SWT35Z10
C154	0.01, 10%	189010A-2	
C155	10, 35V	189719A-9	Hilton SWT35Z10
C156,C157	0.01, 10%	189010A-2	
C158	10, 35V	189719A-9	Hilton SWT35Z10
C159	0.01, 10%	189010A-2	
C160	10, 35V	189719A-9	Hilton SWT35Z10
C161	0.01, 10%	189010A-2	
C162	1000 pF	189010A-1	
C163	0.01, 10%	189010A-2	
C164,C165	1000 pF	189010A-1	
C166	0.01, 10%	189010A-2	
C167	1000 pF	189010A-1	
C168	10, 35V	189719A-9	Hilton SWT35Z10
C169	1000 pF	189010A-1	
C170	10, 35V	189719A-9	Hilton SWT35Z10
C171	1000 pF	189010A-1	
C172	0.01, 10%	189010A-2	
C173	1000 pF	189010A-1	
C174	10, 35V	189719A-9	Hilton SWT35Z10
C175	1000 pF	189010A-1	
C176	10, 35V	189719A-9	Hilton SWT35Z10
C177	220, 25V	89719A-75	Hilton SWT25Z220
C178	1, 20%	189010A-5	
C179	220, 25V	89719A-75	Hilton SWT25Z220
C180	0.1, 10%	189010A-4	
C182	220, 25V	89719A-75	Hilton SWT25Z22
C183	0.01, 10%	189010A-2	
C184	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C185	10, 35V	189719A-9	Hilton SWT35Z10
C186	0.1, 10%	189010A-4	
C187	68 pF	189008A-42	CM05ED680J03
C188	1000 pF	189010A-1	
C189,C190,C191,C192,C193, C194,C195	0.01, 10%	189010A-2	
C196	0.1, 10%	189010A-4	
C197	1, 20%	189010A-5	
C198	0.1, 10%	189010A-4	
C199	8.2, 15V, 20%	89765	Kemet K8R2W15
C200	10, 35V	189719A-9	
	DIODES		
CR1,CR2,CR3	1N914A	189405A	GE
CR4	1N823A	189437A	
CR5,CR6	1N914A	189405A	GE
CR7	BB505, BB121, or BB141	189439A-44	
CR8,CR9,CR10,CR11,CR12,CR13	1N914A	189405A	GE
CR14	MV209	189439-38	
CR15	1N914A	189405A	GE
CR17	BB505, BB121, or BB141	189439A-44	
CR18,CR19	1N6263	89440-86	
	LEDS		
DS1,DS2,DS3	LED	89904-45	
	PINS		
E1,E2,E3,E4,E5,E6,E7,E8,E9, E10,E11,E12,E13,E14,E15,E16, E17,E20,E21,E22,E23,E24, E30,E31,E32,E33,E34,E35, E36,E37,E38	Pin	188500-23	
	FUSES		
F1	2A, 250V Buss AGC	188200-2	
F2	0.5A, Buss AGC	188203	
F3	40 MHz Filter	1841578-4	
	CONNECTORS		
J1	F	189397-5	
J2	BNC	188357-48	
J3,J4	Pin	188500-29	
J5	D	89397-20	
	RELAYS		
K1	Relay	189800-28	Aromat RSD-5V

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2	2.5T	189162-31	
L3	1.5T Shielded	189162-36	
L4	0.56	189169A-57	
L5	1.2	189169A-65	
L6	0.56	189169A-57	
L7	3.3	189169A-31	
L8	Choke	189169-37	Ferroxcube VK200/3B-10
L9,L10	1	189169A-40	
L11	Choke	189169-37	Ferroxcube VK200/3B-10
L12	1.5T Unshielded	189162-89	
L14	Choke	189169-37	Ferroxcube VK200/3B-10
L16	1.2	189169A-65	
L17	1.8	189169A-56	
L18	120, 10%	89162-67	Delvan 1025-70
L19	12-1/2T	89162-62	Coilcraft T7-143
L20	4-1/2T	189162-37	Coilcraft T7-143
L21,L22,L23,L24,L25,L26,L27	Choke	189169-37	Ferroxcube VK200/3B-10
L28	22	189161A-1	
L29,L30	Choke	189169-37	Ferroxcube VK200/3B-10
	MIXERS		
M1,M2,M3,M4,M5,M6	SBL1	89887-3	
	TRANSISTORS		
Q1	2N3904	189700A	Motorola
Q2,Q5	3SK121	189888-53	
Q6	NE41632B	189888-39	
Q7,Q8	MPS918	189774A	
Q9	2N3904	189700A	Motorola
Q10	2N3906	189727A	Motorola
Q11,Q12	VN10KM	89888-70	
Q13	2N3904	189700A	Motorola
Q14,Q15	NE41632B	189888-39	
Q16	2N3904	189700A	Motorola
Q17,Q18	PN4258	189888-50	
Q19	2N3904	189700A	Motorola
Q20	U310	187223-75	Unitrode
Q21	2N3904	189700A	Motorola
Q22	U310	187223-75	Unitrode

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
Q23,Q24	PN4258	189888-50	
Q25	2N3904	189700A	Motorola
Q26	2N3906	189727A	Motorola
Q27,Q28	2N3904	189700A	Motorola
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R1	10	189231A	RC07GF100J
R3	68	189482A	RC07GF680J
R4	560	189235A	RC07GF561J
R5	100	189202A	RC07GF101J
R6,R7	300	189486A	RC07GF301J
R8	75	189280A	RC07GF750J
R9	11K	189238A-35	RC07GF113J
R10	910	189200A-19	
R11	10	189231A	RC07GF100J
R12,R13	10K	189227A	RC07GF103J
R15	510	189481A-19	RC07GF511J
R20	390	189180A	RC07GF391J
R21	110K	189238A-58	RC07GF114J
R22	39K	189494A	RC07GF393J
R23	30K	189481A-25	RC07GF303J
R24	330	189205A	RC07GF331J
R25	33	189478A	RC07GF330J
R26	68	189482A	RC07GF680J
R27	150	189204A	RC07GF151J
R28,R29	100K	189278A	RC07GF104J
R30	3.9K	189224A	RC07GF392J
R31	2.7K	189181A	RC07GF272J
R32	620	189200A-10	RC07GF621J
R33	22K	189228A	RC07GF223J
R38	150	189204A	RC07GF151J
R39	510	189481A-19	RC07GF511J
R41	300	189486A	RC07GF301J
R42,R43,R44	510	189481A-19	RC07GF511J
R45	220	189233A	RC07GF221J
R46	150	189204A	RC07GF151J
R47	68	189482A	RC07GF680J
R48	330	189205A	RC07GF331J
R49	68	189482A	RC07GF680J
R50	200	1894384A	RC07GF201J
R51	510	189481A-19	RC07GF511J
R52	2.4K	189489A	RC07GF242J
R53	910	189200A-19	RC07GF911J
R54	1K	189220A	RC07GF101J
R55,R56,R57,R58	270	189485A	RC07GF271J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R59,R60,R61,R62	33	189478A	RC07GF330J
R63,R64	150	189204A	RC07GF151J
R65	1K	189220A	RC07GF101J
R66	1.2K	189221A	RC07GF122J
R67	1.8K	188248A	RC07GF182J
R68,R69	150	189204A	RC07GF151J
R70,R71	75	189280A	RC07GF750J
R72,R73,R74,R75	15.8K, 1/8W, 1%	188272A	RN55D15R8F
R76	1K, 1/8W, 1%	187460A	RN55D1001F
R77	200, 1/8W, 1%	189327A-62	RN55D2001F
R78	1M, 1/8W, 1%	188541A-34	RN55D1005F
R79	1K	189220A	RC07GF101J
R80	24K	189481A-14	RC07GF243J
R81	1.1K	189200A-27	RC07GF112J
R82	2K	189488A	RC07GF201J
R83	130	189200A-17	RC07GF131J
R84	10K	189227A	RC07GF103J
R85	2K	189488A	RC07GF201J
R86	3.9K	189224A	RC07GF392J
R87	1K	189220A	RC07GF101J
R88	820	189207A	RC07GF821J
R89,R90,R91,R92	2K	189488A	RC07GF201J
R93	1K	189220A	RC07GF101J
R94	5.1K	189491A	RC07GF512J
R95	3K	189490A	RC07GF301J
R96,R97	56	189232A	RC07GF560J
R98	20K	189200A-14	RC07GF203J
R100	620	189200A-10	RC07GF621J
R101	15	189239A	RC07GF150J
R102	330	189205A	RC07GF331J
R103	39	189480A	RC07GF390J
R104	510	189481A-19	RC07GF511J
R105	130	189200-17	RC07GF131J
R106	120	189203	RC07GF121J
R107	130	189200-17	RC07GF131J
R108	Potentiometer, 200	188453-43	Bourns
R109	2K	189488A	RC07GF201J
R110	330	189205A	RC07GF331J
R111	1.2K	189221A	RC07GF122J
R113,R114	604, 1/8W, 1%	189256-33	RN55D604RF
R115	845, 1/8W, 1%	89327-30	RN55D845RF
R116	330	189205A	RC07GF331J
R117	240	189200A-4	RC07GF241J
R118	1.07K, 1/8W, 1%	189262A-28	RN55D1R07F
R119	432, 1/8W, 1%	189327-38	RN55D432RF

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R120	523, 1/8W, 1%	189327-39	RN55D523RF
R121	215, 1/8W, 1%	189256A-7	RN55D215RF
R122	374, 1/8W, 1%	189327A-37	RN55D374RF
R123	215, 1/8W, 1%	189256A-7	RN55D215RF
R124,R125	432, 1/8W, 1%	189327-38	RN55D432RF
R126,R127	100	189202A	RC07GF101J
R128	330	189205A	RC07GF331J
R129,R130	1K	189220A	RC07GF101J
R131	100	189202A	RC07GF101J
R132	330	189205A	RC07GF331J
R133	374, 1/8W, 1%	189327A-37	RN55D374RF
R134	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R135	7.87K	189481A-36	
R136	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R137	75, 1/8W, 1%	187456	RN55D75R0F
R138,R139	130, 1/8W, 1%	189327A-27	RN55D131J
R140	1.1K	189200A-27	RC07GF112J
R141	110	189483A	RC07GF111J
R142	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R143,R144	10K, 1/8W, 1%	189326A	RN55D1003F
R145	1K	189220A	RC07GF101J
R146	57.6, 1/8W, 1%	89261-21	RN55D57R6F
R147	75, 1/8W, 1%	187456A	RN55D75R0F
R148,R149	1M	189238A-30	RC07GF105J
R150	2K	189488A	RC07GF201J
R151	510	189481A-19	RC07GF511J
R152	430	189238A-31	RC07GF431J
R153	820	189207A	RC07GF821J
R154	6.2K	189200A-5	RC07GF622J
R155	5.1K	189491A	RC07GF512J
R156	6.2K	189200A-5	RC07GF622J
R157,R158,R159,R160	150	189204A	RC07GF151J
R161,R162	24	189238A-20	RC07GF240J
R163	390	189180A	RC07GF391J
R165,R166	33	189478A	RC07GF330J
R167,R168	270	189485A	RC07GF271J
R169	33	189478A	RC07GF330J
R170	270	189485A	RC07GF271J
R171,R172	75	189280A	RC07GF750J
R173,R174	15.8K, 1/8W, 1%	188272A	RN55D15R8F

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R175,R176	1.37K, 1/8W, 1%	89262-30	RN55D2R37F
R177	270	189485A	RC07GF271J
R178	33	189478A	RC07GF330J
R179	2.43K, 1/8W, 1%	89311	RN55D2R43F
R180	402K, 1/8W, 1%	188541A-54	RN55D402RF
R181	10K	189227A	RC07GF103J
R182,R183	2K	189488A	RC07GF201J
R184	130	189200A-17	RC07GF131J
R185	3.01K, 1/8W, 1%	188541A-59	RN55D3R01F
R186	1.5K, 1/8W, 1%	189256A-16	RN55D1R50F
R187	3K	189490A	RC07GF301J
R188	9.1K	189200A-12	RC07GF912J
R189	1M, 1/8W, 1%	188541A-34	RN55D1005F
R190	3K	189490A	RC07GF301J
R191	9.1K	189200A-12	RC07GF912J
R192,R193,R194,R195	2K	189488A	RC07GF201J
R196	1K, 1/8W, 1%	187460A	RN55D1001F
R197	1M	189238A-30	RC07GF105J
R199	75	189280A	RC07GF750J
R200	150	189204A	RC07GF151J
R201	470	189234A	RC07GF471J
R202,R203,R204	2K	189488A	RC07GF201J
R205	12, 1W, 5%	188539A-84	
R206	68K	189276A	RC07GF683J
R207	2.7	189481A-13	
R208,R209,R210,R211,R212, R213,R214	1K	189220A	RC07GF101J
R215	510	189481A-19	RC07GF511J
R216	82.5, 1/8W, 1%	187457A	RN55D82R5F
R217	200, 1/8W, 1%	189327A-62	RN55D2001F
R218	Potentiometer, 50K	188453-40	Bourns
R219	82.5, 1/8W, 1%	187457A	RN55D82R5F
R220	200, 1/8W, 1%	189327A-62	RN55D2001F
R221	Potentiometer, 50K	188453-40	Bourns
R222	160, 1/8W, 5%	189262-23	RN55D161RF
R224	1K, 1/8W, 1%	187460A	RN55D1001F
R225	4.42K, 1/8W, 1%	189256A-88	RN55D4R42F
R226	6.81K, 1/8W, 1%	189316A	RN55D6R81F
R227	15	189239A	RC07GF150J
R228	10	189231A	RC07GF100J
R229	2K	189488A	RC07GF201J
R230	2.74K, 1/8W, 1%	87464	RC07GF2R74F
R231	1.27K, 1/8W, 1%	89262-29	RN55D1R27F
R232,R233,R234	1K	189220A	RC07GF101J
R235	1.82K, 1/8W, 1%	188541A-10	RN55D1R82F
R236	10K	189227A	RC07GF103J
R238	1.2K	189221A	RC07GF122J
R239	1K	189220A	RC07GF101J
R240	100	189202A	RC07GF101J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	RESISTOR NETWORKS		
RN2,RN3	10K, 1%	188540-32	4114R-001
	TRANSFORMERS		
T1	Transformer	1841877-1	
T2	Transformer	1840056-2	
	TERMINAL BLOCKS		
TB1	3 Position	189892-24	
TB3	4 Position	189892-25	
	TESTPOINTS		
TP1,TP2,TP3,TP4,TP5	White	188500-19	
TP6	Black	188500-20	
	INTEGRATED CIRCUITS		
U1	78MGU	189889-82	
U2	LF353N	189889-95	
U3	10H116	189975-25	
U4	10131	189976-34	
U5	TL084	189976-96	
U6	74LS01	189976-65	
U7	LM311	189889-11	
U8	LM319N	189975-24	
U9,U10	733	189889-76	
U11,U12	AM687	189976-66	
U13,U14	10131	189976-34	
U15	10102	189976-33	
U16	LF353N	189889-95	
U17	10125	189975-67	
U18	74HC132	89974-33	
U19	10131	189976-34	
U20	TL084	189976-96	
U21	LM311	189889-11	
U22	LM319N	189975-24	
U23	74LS01	189976-65	
U24	MC1648P	189889-8	
U25	LM317L	189975-69	
U26	78M12T	189889-25	
U27	MC7912 Voltage Regulator	89976-67	
U28	79M05T	89889-91	
U29	7805T	189975-72	
U30	LM317T	89889-62	
U31	AM687	189976-66	
U32	MC1648P	189889-8	
U33	MWA130 Hybrid Amp	189889-72	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	VARISTORS		
VR1,VR2	Varistor	189195-1	GE V47ZA7
	SHORTING PLUGS		
W1,W2,W3,W4,W5,W6,W7	Shorting Plug	188500-23	
	CRYSTALS		
Y1	10.000 MHz	189526-17	

RECEIVER BASEBAND BOARD PWB ASSEMBLY PN 1841562-5

CAPACITORS

All capacitors are in microfarads unless otherwise specified.

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C1,C2	15 pF	189117A	CM05ED150J03
C3	12 pF	189085A	CM05ED120J03
C4,C5	1000 pF	189010A-1	
C6	33 pF	189139A	CM05ED330J03
C7	1000 pF	189010A-1	
C8	33 pF	189139A	CM05ED330J03
C9,C10	0.01, 10%	189010A-2	
C12	10, 35V	189719A-9	Hilton SWT35Z10
C13	1000 pF	189010A-1	
C14	0.1, 10%	189010A-4	
C15	1000 pF	189010A-1	
C16,C17	10, 35V	189719A-9	Hilton SWT35Z10
C18	0.01, 10%	189010A-2	
C20	10, 35V	189719A-9	Hilton SWT35Z10
C21	1000 pF	189010A-1	
C22,C23	0.01, 10%	189010A-2	
C24	510 pF	189017A-51	CM05ED511J03
C25	1000 pF	189010A-1	
C26,C27,C28	0.01, 10%	189010A-2	
C29	1000 pF	189010A-1	
C30	0.1, 10%	189010A-4	
C31	1000 pF	189010A-1	
C32,C33,C34,C35	0.1, 10%	189010A-4	
C36,C37	0.01, 10%	189010A-2	
C38	0.1, 10%	189010A-4	
C39,C40,C41,C42,C43	0.01, 10%	189010A-2	
C44,C45	62 pF	189008A-71	CM05ED620J03
C46	0.1, 10%	189010A-4	
C47	100 pF	189086A	CM05ED101J03
C48	0.1, 10%	189010A-4	
C49	6 ± 0.5 pF	89017A-53	
C50	8 pF	189008A-86	CM05ED080J03
C51,C52	1000 pF	189010A-1	
C53,C54	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C55	18 pF	189008A-95	
C56	0.01, 10%	189010A-2	
C57	82 pF	189081A	CM05ED820J03
C58	12 pF	189085A	CM05ED120J03
C59	300 pF	189017A-52	CM05ED301J03
C60	3 pF	189079A	CM05ED030J03
C61	270 pF	189141A	CM05ED271J03
C62	10, 35V	189719A-9	Hilton SWT35Z10
C63	0.1, 10%	189010A-4	
C64	1, 20%	189010A-5	
C65	33 pF, 1%	89018-57	CM05ED330J03
C66	10, 35V	189719A-9	Hilton SWT35Z10
C67	0.1, 10%	189010A-4	
C68	1, 20%	189010A-5	
C69	27 pF, 1%	189009-2	CM05ED270J03
C70	12 pF, 1%	189018-9	CM05ED120J03
C71	43 pF, 1%	189018-12	CM05ED430J03
C72	330 pF, 1%	189018-6	CM05ED331J03
C73	20 pF	189008A-5	CM05ED200J03
C74	0.1, 10%	189010A-4	
C75	1000 pF	189010A-1	
C76	100 pF, 1%	189008-80	CM05ED101J03
C77,C78	27 pF, 1%	189009-2	CM05ED270J03
C79	43 pF, 1%	189018-8	CM05ED430J03
C80	20 pF	189008A-5	CM05ED200J03
C81	0.1, 10%	189010A-4	
C82	0.01, 10%	189010A-2	
C83	10, 35V	189719A-9	Hilton SWT35Z10
C84,C85,C86,C87	0.1, 10%	189010A-4	
C88	680 pF	189018-8	CM05ED681J03
C89	0.01, 10%	189010A-2	
C90	75 pF	189018-23	CM05ED750J03
C91,C92,C93,C94,C95, C96,C97	0.1, 10%	189010A-4	
C98	470 pF, 1%	189008A-29	CM05ED471J0
C99	380 pF, 1%	89018-53	CM05ED381J03
C100,C101,C102	0.1, 10%	189010A-4	
C103	1000 pF	189010A-1	
C104	390 pF, 1%	89017-1	CM05ED391J03
C105	20 pF, 1%	89018-49	CM05ED200J03
C106	470 pF	189008A-29	CM05ED471J03
C107,C108,C109,C110,C111	10, 35V	189719A-9	Hilton SWT35Z10
C112	1000 pF	189010A-1	
C113	10, 35V	189719A-9	Hilton SWT35Z10
C114,C115	0.01, 10%	189010A-2	
C116,C117	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C118,C119,C120	0.01, 10%	189010A-2	
C121	1, 20%	189010A-5	
C122,C123,C124,C125,C126, C127,C128,C129,C130	0.01, 10%	189010A-2	
C131	0.1, 10%	189010A-4	
C132	0.01, 10%	189010A-2	
C133,C134	0.1, 10%	189010A-4	
C135,C136	0.01, 10%	189010A-2	
C138	0.1, 10%	189010A-4	
C139,C140	0.01, 10%	189010A-2	
C141	1, 20%	189010A-5	
C142	0.01, 10%	189010A-2	
C143	1000 pF	189010A-1	
C144,C145,C146,C147,C148, C149,C150,C151,C152	0.01, 10%	189010A-2	
C153	10, 35V	189719A-9	Hilton SWT35Z10
C154	0.01, 10%	189010A-2	
C155	10, 35V	189719A-9	Hilton SWT35Z10
C156,C157	0.01, 10%	189010A-2	
C158	10, 35V	189719A-9	Hilton SWT35Z10
C159	0.01, 10%	189010A-2	
C160	10, 35V	189719A-9	Hilton SWT35Z10
C161	0.01, 10%	189010A-2	
C162	1000 pF	189010A-1	
C163	0.01, 10%	189010A-2	
C164,C165	1000 pF	189010A-1	
C166	0.01, 10%	189010A-2	
C167	1000 pF	189010A-1	
C168	10, 35V	189719A-9	Hilton SWT35Z10
C169	1000 pF	189010A-1	
C170	10, 35V	189719A-9	Hilton SWT35Z10
C171	1000 pF	189010A-1	
C172	0.01, 10%	189010A-2	
C173	1000 pF	189010A-1	
C174	10, 35V	189719A-9	Hilton SWT35Z10
C175	1000 pF	189010A-1	
C176	10, 35V	189719A-9	Hilton SWT35Z10
C177	220, 25V	89719A-75	Hilton SWT25Z220
C178	1, 20%	189010A-5	
C179	220, 25V	89719A-75	Hilton SWT25Z220
C180	0.1, 10%	189010A-4	
C182	220, 25V	89719A-75	Hilton SWT25Z22
C183	0.01, 10%	189010A-2	
C184	0.1, 10%	189010A-4	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
C185	10, 35V	189719A-9	Hilton SWT35Z10
C186	0.1, 10%	189010A-4	
C187	68 pF	189008A-42	CM05ED680J03
C188	1000 pF	189010A-1	
C189,C190,C191,C192,C193, C194,C195	0.01, 10%	189010A-2	
C196	0.1, 10%	189010A-4	
C197	1, 20%	189010A-5	
C198	0.1, 10%	189010A-4	
C199	8.2, 15V, 20%	189765A	Kemet K8R2W15
C200	10, 35V	189719A-9	
	DIODES		
CR1,CR2,CR3	1N914A	189405A	GE
CR4	1N823A	189437A	
CR5,CR6	1N914A	189405A	GE
CR7	BB505, BB121, or BB141	189439A-44	
CR8,CR9,CR10,CR11,CR12,CR13	1N914A	189405A	GE
CR14	BB105	189439-54	
CR15	1N914A	189405A	GE
CR17	BB505, BB121, or BB141	189439A-44	
CR18,CR19	1N6263	89440-86	
	LEDS		
DS1,DS2,DS3	LED	89904-45	
	PINS		
E1,E2,E3,E4,E5,E6,E7,E8,E9, E10,E11,E12,E13,E14,E15,E16, E17,E20,E21,E22,E23,E24, E30,E31,E32,E33,E34,E35, E36,E37,E38	Pin	188500-23	
	FUSES		
F1	2A, 250V Buss AGC	188200-2	
F2	0.5A, Buss AGC	188203	
F3	40 MHz Filter	1841578-5	
	CONNECTORS		
J1	F	189397-5	
J2	BNC	188357-48	
J3,J4	Pin	188500-29	
J5	D	89397-20	
	RELAYS		
K1	Relay	189800-28	Aromat RSD-5V

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2	2.5T	189162-31	
L3	1.5T Shielded	189162-36	
L4	0.56	189169A-57	
L5	1.2	189169A-65	
L6	0.56	189169A-57	
L7	3.3	189169A-31	
L8	Choke	189169-37	Ferroxcube VK200/3B-10
L9,L10	1	189169A-40	
L11	Choke	189169-37	Ferroxcube VK200/3B-10
L12	1.5T Unshielded	189162-89	
L14	Choke	189169-37	Ferroxcube VK200/3B-10
L16	1.2	189169A-65	
L17	1.8	189169A-56	
L18	82, 5%	89162-68	Delvan
L19	11-1/2T	89162-63	Coilcraft T7-143
L20	1-1/2T	189162-36	Coilcraft T7-142
L21,L22,L23,L24,L25,L26,L27	Choke	189169-37	Ferroxcube VK200/3B-10
L28	22	189161A-1	
L29,L30	Choke	189169-37	Ferroxcube VK200/3B-10
	MIXERS		
M1,M2,M3,M4,M5,M6	SBL1	89887-3	
	TRANSISTORS		
Q1	2N3904	189700A	Motorola
Q2,Q5	3SK121	189888-53	
Q6	NE41632B	189888-39	
Q7,Q8	MPS918	189774A	
Q9	2N3904	189700A	Motorola
Q10	2N3906	189727A	Motorola
Q11,Q12	VN10KM	89888-70	
Q13	2N3904	189700A	Motorola
Q14,Q15	NE41632B	189888-39	
Q16	2N3904	189700A	Motorola
Q17,Q18	PN4258	189888-50	
Q19	2N3904	189700A	Motorola
Q20	U310	187223-75	Unitrode
Q21	2N3904	189700A	Motorola
Q22	U310	187223-75	Unitrode

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
Q23,Q24	PN4258	189888-50	
Q25	2N3904	189700A	Motorola
Q26	2N3906	189727A	Motorola
Q27,Q28	2N3904	189700A	Motorola

RESISTORS

All resistors are in 1/4W 5% ohms unless otherwise specified.

R1	10	189231A	RC07GF100J
R3	68	189482A	RC07GF680J
R4	560	189235A	RC07GF561J
R5	100	189202A	RC07GF101J
R6,R7	300	189486A	RC07GF301J
R8	75	189280A	RC07GF750J
R9	11K	189238A-35	RC07GF113J
R10	910	189200A-19	
R11	10	189231A	RC07GF100J
R12,R13	10K	189227A	RC07GF103J
R15	510	189481A-19	RC07GF511J
R20	390	189180A	RC07GF391J
R21	110K	189238A-58	RC07GF114J
R22	39K	189494A	RC07GF393J
R23	30K	189481A-25	RC07GF303J
R24	330	189205A	RC07GF331J
R25	33	189478A	RC07GF330J
R26	68	189482A	RC07GF680J
R27	150	189204A	RC07GF151J
R28,R29	100K	189278A	RC07GF104J
R30	3.9K	189224A	RC07GF392J
R31	2.7K	189181A	RC07GF272J
R32	620	189200A-10	RC07GF621J
R33	22K	189228A	RC07GF223J
R38	150	189204A	RC07GF151J
R39	510	189481A-19	RC07GF511J
R41	300	189486A	RC07GF301J
R42,R43,R44	510	189481A-19	RC07GF511J
R45	220	189233A	RC07GF221J
R46	150	189204A	RC07GF151J
R47	68	189482A	RC07GF680J
R48	330	189205A	RC07GF331J
R49	68	189482A	RC07GF680J
R50	200	189484A	RC07GF201J
R51	510	189481A-19	RC07GF511J
R52	2.4K	189489A	RC07GF242J
R53	910	189200A-19	RC07GF911J
R54	1K	189220A	RC07GF101J
R55,R56,R57,R58	270	189485A	RC07GF271J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R59,R60,R61,R62	33	189478A	RC07GF330J
R63,R64	150	189204A	RC07GF151J
R65	1K	189220A	RC07GF101J
R66	1.2K	189221A	RC07GF122J
R67	1.8K	188248A	RC07GF182J
R68,R69	150	189204A	RC07GF151J
R70,R71	75	189280A	RC07GF750J
R72,R73,R74,R75	15.8K, 1/8W, 1%	188272A	RN55D15R8F
R76	1K, 1/8W, 1%	187460A	RN55D1001F
R77	200, 1/8W, 1%	189327A-62	RN55D2001F
R78	1M, 1/8W, 1%	188541A-34	RN55D1005F
R79	1K	189220A	RC07GF101J
R80	24K	189481A-14	RC07GF243J
R81	1.1K	189200A-27	RC07GF112J
R82	2K	189488A	RC07GF201J
R83	130	189200A-17	RC07GF131J
R84	10K	189227A	RC07GF103J
R85	2K	189488A	RC07GF201J
R86	3.9K	189224A	RC07GF392J
R87	1K	189220A	RC07GF101J
R88	820	189207A	
R89,R90,R91,R92	2K	189488A	RC07GF201J
R93	1K	189220A	RC07GF101J
R94	5.1K	189491A	RC07GF512J
R95	3K	189490A	RC07GF301J
R96,R97	56	189232A	RC07GF560J
R98	20K	189200A-14	RC07GF203J
R100	620	189200A-10	RC07GF621J
R101	15	189239A	RC07GF150J
R102	330	189205A	RC07GF331J
R103	39	189480A	RC07GF390J
R104	510	189481A-19	RC07GF511J
R105	120	189203	RC07GF121J
R106	150	189204	RC07GF151J
R107	120	189203	RC07GF121J
R108	Potentiometer, 200	188453-43	Bourns
R109	2K	189488A	RC07GF201J
R110	330	189205A	RC07GF331J
R111	1.2K	189221A	RC07GF122J
R113,R114	604, 1/8W, 1%	189256-33	RN55D604RF
R115	806, 1/8W, 1%	89262-26	RN55D806RF
R116	330	189205A	RC07GF331J
R117	240	189200A-4	RC07GF241J
R118	1.07K, 1/8W, 1%	189262A-28	RN55D1R07F
R119	432, 1/8W, 1%	189327-38	RN55D432RF

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R120	523, 1/8W, 1%	189327-39	RN55D523RF
R121	215, 1/8W, 1%	189256A-7	RN55D215RF
R122	374, 1/8W, 1%	189327A-37	RN55D374RF
R123	215, 1/8W, 1%	189256A-7	RN55D215RF
R124,R125	432, 1/8W, 1%	189327-38	RN55D432RF
R126,R127	100	189202A	RC07GF101J
R128	330	189205A	RC07GF331J
R129,R130	1K	189220A	RC07GF101J
R131	100	189202A	RC07GF101J
R132	330	189205A	RC07GF331J
R133	374, 1/8W, 1%	189327A-37	RN55D374RF
R134	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R135	7.87K	189481A-36	
R136	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R137	75, 1/8W, 1%	187456A	RN55D75R0F
R138,R139	130, 1/8W, 1%	189327A-27	RN55D131J
R140	1.1K	189200A-27	RC07GF112J
R141	110	189483A	RC07GF111J
R142	1.21K, 1/8W, 1%	188541A-35	RN55D1R21F
R143,R144	10K, 1/8W, 1%	189326A	RN55D1003F
R145	1K	189220A	RC07GF101J
R146	76.8, 1/8W, 1%	89262-22	RN55D76R8F
R147	75, 1/8W, 1%	187456A	RN55D75R0F
R148,R149	1M	189238A-30	RC07GF105J
R150	2K	189488A	RC07GF201J
R151	510	189481A-19	RC07GF511J
R152	430	189238A-31	RC07GF431J
R153	820	189207A	RC07GF821J
R154	6.2K	189200A-5	RC07GF622J
R155	5.1K	189491A	RC07GF512J
R156	6.2K	189200A-5	RC07GF622J
R157,R158,R159,R160	150	189204A	RC07GF151J
R161,R162	24	189238A-20	RC07GF240J
R163	390	189180A	RC07GF391J
R165,R166	33	189478A	RC07GF330J
R167,R168	270	189485A	RC07GF271J
R169	33	189478A	RC07GF330J
R170	270	189485A	RC07GF271J
R171,R172	75	189280A	RC07GF750J
R173,R174	15.8K, 1/8W, 1%	188272A	RN55D15R8F

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R175,R176	1.02K, 1/8W, 1%	89262-27	RN55D1R02F
R177	270	189485A	RC07GF271J
R178	33	189478A	RC07GF330J
R179	1.87K, 1/8W, 1%	89262-27	RN55D1R87F
R180	402K, 1/8W, 1%	188541A-54	RN55D402RF
R181	10K	189227A	RC07GF103J
R182,R183	2K	189488A	RC07GF201J
R184	130	189200A-17	RC07GF131J
R185	3.01K, 1/8W, 1%	188541A-59	RN55D3R01F
R186	1.5K, 1/8W, 1%	189256A-16	RN55D1R50F
R187	3K	189490A	RC07GF301J
R188	9.1K	189200A-12	RC07GF912J
R189	1M, 1/8W, 1%	188541A-34	RN55D1005F
R190	3K	189490A	RC07GF301J
R191	9.1K	189200A-12	RC07GF912J
R192,R193,R194,R195	2K	189488A	RC07GF201J
R196	1K, 1/8W, 1%	187460A	RN55D1001F
R197	1M	189238A-30	RC07GF105J
R199	75	189280A	RC07GF750J
R200	150	189204A	RC07GF151J
R201	470	189234A	RC07GF471J
R202,R203,R204	2K	189488A	RC07GF201J
R205	12, 1W, 5%	188539A-84	
R206	68K	189276A	RC07GF683J
R207	2.7	189481A-13	
R208,R209,R210,R211,R212, R213,R214	1K	189220A	RC07GF101J
R215	510	189481A-19	RC07GF511J
R216	82.5, 1/8W, 1%	187457A	RN55D82R5F
R217	200, 1/8W, 1%	189327A-62	RN55D2001F
R218	Potentiometer, 50K	188453-40	Bourns
R219	82.5, 1/8W, 1%	187457A	RN55D82R5F
R220	200, 1/8W, 1%	189327A-62	RN55D2001F
R221	Potentiometer, 50K	188453-40	Bourns
R222	160, 1/8W, 5%	189262-23	
R224	1K, 1/8W, 1%	187460A	RN55D1001F
R225	4.42K, 1/8W, 1%	189256A-88	RN55D4R42F
R226	6.81K, 1/8W, 1%	189316A	RN55D6R81F
R227	15	189239A	RC07GF150J
R228	10	189231A	RC07GF100J
R229	2K	189488A	RC07GF201J
R230	2.74K, 1/8W, 1%	87464	RC07GF2R74F
R231	1.43K, 1/8W, 1%	89262-31	RN55D1R43F
R232,R233,R234	1K	189220A	RC07GF101J
R235	1.82K, 1/8W, 1%	188541A-10	RN55D1R82F
R236	10K	189227A	RC07GF103J
R238	1.2K	189221A	RC07GF122J
R239	1K	189220A	RC07GF101J
R240	100	189202A	RC07GF101J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	RESISTOR NETWORKS		
RN2,RN3	10K, 1%	188540-32	4114R-001
	TRANSFORMERS		
T1	Transformer	1841877-1	
T2	Transformer	1840056-2	
	TERMINAL BLOCKS		
TB1	3 Position	189892-24	
TB3	4 Position	189892-25	
	TESTPOINTS		
TP1,TP2,TP3,TP4,TP5	White	188500-19	
TP6	Black	188500-20	
	INTEGRATED CIRCUITS		
U1	78MGU	189889-82	
U2	LF353N	189889-95	
U3	10H116	189975-25	
U4	10131	189976-34	
U5	TL084	189976-96	
U6	74LS01	189976-65	
U7	LM311	189889-11	
U8	LM319N	189975-24	
U9,U10	733	189889-76	
U11,U12	AM687	189976-66	
U13,U14	10131	189976-34	
U15	10102	189976-33	
U16	LF353N	189889-95	
U17	10125	189975-67	
U18	74HC132	89974-33	
U19	10131	189976-34	
U20	TL084	189976-96	
U21	LM311	189889-11	
U22	LM319N	189975-24	
U23	74LS01	189976-65	
U24	MC1648P	189889-8	
U25	LM317L	189975-69	
U26	78M12T	189889-25	
U27	MC7912 Voltage Regulator	89976-67	
U28	79M05T	89889-91	
U29	7805T	189975-72	
U30	LM317T	89889-62	
U31	AM687	189976-66	
U32	MC1648P	189889-8	
U33	MWA130 Hybrid Amp	189889-72	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	VARISTORS		
VR1,VR2	Varistor	189195-1	GE V47ZA7
	SHORTING PLUGS		
W1,W2,W3,W4,W5,W6,W7	Shorting Plug	188500-23	
	CRYSTALS		
Y1	10.000 MHz	189526-17	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
40 MHz IF FILTER PWB ASSEMBLY PN 1841578-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C2	3 pF	189018A-13	CM05ED030J03
C4	39 pF	189018A-11	CM05ED390J03
C6	51 pF	189009A-8	CM05ED510J03
C7	82 pF	189008A-72	CM05ED820J03
C9	51 pF	189009A-8	CM05ED510J03
C10	39 pF	189018A-11	CM05ED390J03
C12	300 pF	189008A-73	CM05ED301J03
C15	62 pF	189008A-71	CM05ED620J03
C17	15 pF	189008A-94	CM05ED150J03
C18	51 pF	189009A-8	CM05ED510J03
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3	6-1/2T	189162-35	Coilcraft

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
40 MHz IF FILTER PWB ASSEMBLY PN 1841578-2			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1	12 pF	189018A-9	CM05ED120J03
C3	43 pF	189009A-7	CM05ED430J03
C6	56 pF	189008A-67	CM05ED560J03
C7	47 pF	189008A-79	CM05ED470J03
C9	56 pF	189008A-67	CM05ED560J03
C10	24 pF	189009A-1	CM05ED240J03
C12	130 pF	189008A-69	CM05ED131J03
C14	51 pF	189009A-8	CM05ED510J03
C17	43 pF	189009A-7	CM05ED430J03
C19	130 pF	189008A-69	CM05ED131J03
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3	6-1/2T	189162-35	Coilcraft

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
40 MHz IF FILTER PWB ASSEMBLY PN 1841578-3			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1	20 pF	89018-49	CM05ED200J03
C3	82 pF	189008A-72	CM05ED820J03
C5	30 pF	189009A-3	CM05ED300J03
C6	33 pF	89018-57	CM05ED330J03
C7	100 pF	189008A-80	CM05ED101J03
C8	12 pF	189018A-9	CM05ED120J03
C9	33 pF	89018-57	CM05ED330J03
C10	39 pF	189018A-11	CM05ED390J03
C11	22 pF	189008A-97	CM05ED220J03
C12	330 pF	189018A-6	CM05ED331J03
C14	62 pF	189008A-71	CM05ED620J03
C16	22 pF	189008A-97	CM05ED220J03
C17	15 pF	189008A-94	CM05ED150J03
C19	22 pF	189008A-97	CM05ED220J03
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3	6-1/2T	189162-35	Coilcraft

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
40 MHz IF FILTER PWB ASSEMBLY PN 1841578-4			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C2	47 pF	189008A-79	CM05ED470J03
C3	39 pF	189018A-11	CM05ED390J03
C6	43 pF	189009A-7	CM05ED430J03
C7	75 pF	189018A-23	CM05ED750J03
C8	3 pF	189018A-13	CM05ED030J03
C9	18 pF	189008A-95	CM05ED180J03
C11	510 pF	189018A-7	CM05ED511J03
C12	2 pF	189017A-20	CM05ED020J03
C14	43 pF	189009A-7	CM05ED430J03
C17	510 pF	189018A-7	CM05ED511J03
C18	39 pF	189018A-11	CM05ED390J03
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3	7-1/2T	189162-35	Coilcraft T7-142

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
40 MHz IF FILTER PWB ASSEMBLY PN 1841578-5			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1	39 pF	189018A-11	CM05ED390J03
C3	910 pF	189017A-5	CM05ED911J03
C6	62 pF	189008A-71	CM05ED620J03
C7	3 pF	189018A-13	CM05ED030J03
C9	18 pF	189008A-95	CM05ED180J03
C11	270 pF	189018A-5	CM05ED271J03
C12	220 pF	189018A-24	CM05ED221J03
C15	47 pF	189008A-79	CM05ED470J03
C17	100 pF	189008A-80	CM05ED101J03
C19	12 pF	189018A-9	CM05ED120J03
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1	8-1/2T	189162-51	Coilcraft T7-142
L2,L3	7-1/2T	189162-35	Coilcraft T7-142

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RECEIVER POWER SUPPLY ASSEMBLY PN 1841570-1			
	Power Supply PWB Assembly	1841554-1	MAC
	Transformer	1841573	MAC
	Bracket	1841571-1	MAC
	Connector, Filtered, AC Input	189198-92	MAC
CR1,CR3	Bridge Rectifier, BR-66	189439-40	
	Lug, Crimp	188380-76	
	Fuses		
	1A Slo-Blo	188200-7	
	0.5A Slo-Blo (Optional)	188200-27	
	Heatsink	842117-1	MAC
	Without Heatsink	842117-2	MAC

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RECEIVER POWER SUPPLY PWB ASSEMBLY PN 1841554-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2,C3	4700, 35V	189719-56	
	DIODES		
CR2	Rectifier Bridge BR-66	189439-40	
	TERMINALS		
E1,E2,E3,E4,E5,E6,E7,E8,E9, E10,E11,E12,E13,E14,E15, E16,E17,E18	Bifurcated	184844-33	
	CONNECTORS		
J1	Pin	188500-29	Berg 75401

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
DC/DC CONVERTER ASSEMBLY 843490-1			
	DC/DC Converter PWB Assembly	843512-1	MAC
	Bracket	843491-1	MAC
	Heatsink	843504-1	MAC
	Wire Harness Assembly	843755-1	
	Terminal Block, 2 Position	89892-39	
HY1,HY2	DC/DC Converter #132	843494-4	Vicor
	Integrated Circuit, LM317T	89889-62	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
DC/DC CONVERTER PWB ASSEMBLY PN 843512-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2	750 pF	89007-3	CM05ED751J03
C3	10, 100V	89720-14	
C4	40, 75V	88129	
C5	1.5, 50V	89016	Kemet K1R5W50
C6	100, 50V	189719-88	
C7	1000 pF	189008-69	
C8,C9	100, 50V	189719-88	
C10	1.5, 50V	89016	Kemet K1R5W50
C11	1000 pF	189008-69	
	DIODES		
CR1	1N4006	189440A-58	
	TERMINALS		
E1,E2	Bifurcated 145M	184844-33	
E3,E4	Pin	188500-29	Berg
	FUSES		
F1	3A, Slo-Blo	88200-19	
	CONNECTORS		
J1,J2	Pin	188500-29	Berg
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1	Choke	189169-37	VK200
L2	Inductor	89761	Miller 5220
L3,L4,L5	Choke	189169-37	VK200
	RESISTORS		
All resistors are in ohms 1/4W 5% unless otherwise specified.			
R1	7.5K	189481A-44	RC07GF752J
R2	Potentiometer, 10K	88453-73	
R3	7.5K	189481A-44	RC07GF752J
R4	Potentiometer, 10K	88453-73	
R5	243, 1/4W, 1%	89256-75	
R6	1.74K, 1/4W, 1%	89327-93	
	SHORTING PLUGS		
W1	Shorting Plug	188500-23	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	VARISTORS		
VR1	Varistor	89195-9	GE V68Z10

RF BOX ASSEMBLY (DUPLEX) PN 1841478-1

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	Receiver Regulator PWB	1841788-1	MAC
	Transmitter Regulator PWB	1841788-2	
	RFI Filter	1841720-1	MAC
	Receiver Mixer/Oscillator/Preamplifier Assy	1842870-99	MAC
	140 MHz IF Amplifier PWB Assembly	1843901-1	MAC
	Housing	1841479-1	MAC
	Mounting Plate		
	RF Assembly	1841474-1	MAC
	IF Amplifier	1841928-1	MAC
	Waveguide Assembly		
	WR-42	1841727-1	MAC
	Interface	1841723-1	MAC
	Circulator	1841724-1	MAC
	Termination	1841725-1	MAC
	Filter	1841726-99	MAC
	TX Source	1840242-99	MAC
	TX Source Bracket	1841781-1	MAC
	Wire Harness Assembly	1841847-1	MAC
	IF Amplifier Wire Harness Assembly	1841879-1	MAC
	Waveguide Window	1841878-1	MAC
	O-Ring	188443-76	
	Connector, 11 Pin Recp.	188358-93	
	Gasket	188358-64	
	Cable Assembly, F(M) to F(M)	1840164-9	MAC
	Cable Assembly, F(M) to F(M)	1840164-7	MAC
	Adapter, Pin Type to F	189397-14	Gilbert G-CH-BAFF-KS
	Adapter, F to KS	1842038-1	Gilbert GF-625-CH
	Connector Lock Nut	189397-12	Gilbert G-625

RF BOX ASSEMBLY (TX SIMPLEX) PN 1841478-2

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	Transmitter Regulator PWB	1841788-2	MAC
	RFI Filter	1841720-1	MAC
	Housing	1841479-1	MAC
	Mounting Plate		
	RF Assembly	1841474-1	MAC
	Waveguide Assembly		
	WR-42	1841727-2	MAC
	Interface	1841723-1	MAC
	Circulator	1841724-1	MAC
	Termination	1841725-1	MAC
	TX Source	1840242-99	MAC
	TX Source Bracket	1841781-1	MAC
	Wire Harness Assembly	1841847-1	MAC
	Waveguide Window	1841878-1	MAC
	O-Ring	188443-76	
	Connector, 11 Pin Recp.	188358-93	
	Gasket	188358-64	
	Cable Assembly, F(M) to F(M)	1840164-9	MAC
	Adapter, Pin Type to F	189397-14	Gilbert G-CH-BAFF-KS
	Adapter, F to KS	1842038-1	Gilbert GF-625-CH
	Connector Lock Nut	189397-12	Gilbert G-625
	Hole Plug	189990-78	

RF BOX ASSEMBLY (RX SIMPLEX) PN 1841478-3

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	Receiver Regulator PWB	1841788-1	MAC
	RFI Filter	1841720-1	MAC
	Receiver Mixer/Oscillator/Preamplifier Assy	1842870-99	MAC
	140 MHz IF Amplifier PWB Assembly	1843901-1	MAC
	Housing	1841479-1	MAC
	Mounting Plate		
	RF Assembly	1841474-1	MAC
	IF Amplifier	1841928-1	MAC
	Waveguide Assembly		
	WR-42	1841727-1	MAC
	Interface	1841723-1	MAC
	90° H Bend	1842036-1	MAC
	Circulator	1841724-1	MAC
	Termination	1841725-1	MAC
	IF Amplifier Wire Harness Assembly	1841879-1	MAC
	Waveguide Window	1841878-1	MAC
	O-Ring	188443-76	
	Connector, 11 Pin Recp.	188358-93	
	Gasket	188358-64	
	Cable Assembly, F(M) to F(M)	1840164-7	MAC
	Adapter, Pin Type to F	189397-14	Gilbert G-CH-BAFF-KS
	Adapter, F to KS	1842038-1	Gilbert GF-625-CH
	Connector Lock Nut	189397-12	Gilbert G-625
	Mounting Plate, IF Amp	1841928-1	MAC

TRANSMITTER VOLTAGE REGULATOR BOARD PWB ASSEMBLY PN 1841788-2

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1	0.01, 63V	189010A-2	
C2	22, 35V	189139A-42	Hilton SWT35Z22
C4	10, 35V	189719A-9	Hilton SWT35Z10
C5	470 pF, 500V, 5%	189008A-29	CM05ED471J03
C6	10, 35V	189719A-9	Hilton SWT35Z10
C7	8.2, 15V	189765	Kemet
C8	2200, 16V	189719-79	
C9	10, 35V	189719A-9	Hilton SWT35Z10
C10	470, 16V	189018-26	
C12,C14	0.01, 63V	189010A-2	
	DIODES		
CR1,CR2	1N4006	189440-58	
	TERMINALS		
E3,E4,E5,E6,E7,E8,E9,	Bifurcated	184844-33	
	CONNECTORS		
J1	7 Pin Locking	189354-7	Molex
J2	6 Pin Locking	189354-6	Molex
J3	Type F	189396-48	
	TRANSISTORS		
Q1	MJE6041	189888-58	MAC
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R1	1K	189220A	RC07GF101J
R2,R3	2.4K	189489A	RC07GF242J
R4	0.33, 2W, 5%	189253-8	
R5	1K	189220A	RC07GF101J
R6	Potentiometer, 2K	188453-66	Helitrim
R7	3K	189490A	RC07GF301J
R8	Potentiometer, 2K	188453-66	Helitrim
R9	4.22K, 1/8W, 1%	188541A-33	RN55D4R22F
R11	2.7K	189181A	RC07GF272J
R12	33K	189230A	RC07GF333J
R13	300	189486A	RC07GF301J
R14	Potentiometer, 10	188453-33	Helitrim
R15	3.9K	189224A	RC07GF392J
R16,R17	1K	189220A	RC07GF101J
	INTEGRATED CIRCUITS		
U1	723CN	189975-8	
U2	μA78G	189889-81	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RECEIVER VOLTAGE REGULATOR BOARD PN 1841788-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1	0.01, 63V	189010A-2	
C2	22, 35V	189139A-42	Hilton SWT35Z22
C3	0.01, 63V	189010A-2	
C4	10, 35V	189719A-9	Hilton SWT35Z10
C5	470 pF, 500V, 5%	189008A-29	CM05ED471J03
C6	10, 35V	189719A-9	Hilton SWT35Z10
C7	8.2, 15V	189765	Kemet
C9,C11	10, 35V	189719A-9	Hilton SWT35Z10
C12,C13,C14	0.01, 63V	189010A-2	
C15	10, 35V	189719A-9	Hilton SWT35Z10
	DIODES		
CR1,CR2,CR3	1N4006	189440-58	
	TERMINALS		
E1,E2,E3,E4,E5,E6,E7,E8,E9,E10	Bifurcated	184844-33	
	CONNECTORS		
J1	7 Pin Locking	189354-7	Molex
J2	6 Pin Locking	189354-6	Molex
	TRANSISTORS		
Q1	MJE6041	189888-58	
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R2,R3	2.4K	189489A	RC07GF242J
R4	0.33, 2W, 5%	189253-8	
R5	1K	189220A	RC07GF101J
R6	Potentiometer, 2K	188453-66	Helitrim
R7	3K	189490A	RC07GF301J
R9	4.22K, 1/8W, 1%	188541A-33	RN55D4R22F
R10	5.9K, 1/8W, 1%	188541A-22	RN55D5R90F
R12	33K	189230A	RC07GF333J
R17,R18	1K	189220A	RC07GF101J
	INTEGRATED CIRCUITS		
U1	723CN	189975-8	
U2	µA78G	189889-81	
U3	µA79M12	189976-92	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RFI BOARD PWB ASSEMBLY PN 1841720-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise spcified.			
C1,C2,C3,C4,C5	0.01, 100V	189010A-2	
	TERMINALS		
E1,E2,E3,E4,E5,E6,E7,E8,E9,E10	Bifurcated	184844-33	
	CONNECTORS		
J1,J2	6 Pin Lock	189354-6	Molex
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3,L4,L5	Inductor	189169-37	Ferroxcube VK200-10/3B
	VARISTORS		
VR1,VR2,VR3,VR4,VR5	V47Z47	189195-1	GE

MIXER/OSCILLATOR/PREAMP ASSEMBLY 842870-1

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	140 MHz Preamp	1841936-1	MAC
	24 GHz Mixer/Oscillator	See Table	
	Temperature Control PWB Assy	842744-1	MAC
	Wire Harness Assembly	842869-1	MAC
	Brackets		
	Temperature Control Board	842867-1	MAC
	Heatsink	842868-1	MAC
	Support	1840837-1	MAC
	Connector, Type F (M to F)	1842068-1	MAC
	Covers		
	Top	1840846-1	MAC
	Bottom	1840831-1	MAC
	Spacer	843301-2	MAC
Q1	Transistor, MJE 6044	189888-51	
R1	Resistor, 15Ω, 10W	188541-51	Dale

Table 1

FREQUENCY (GHz)	24 GHz MIXER/ OSCILLATOR
21.9 to 22.0	842871-1
23.1 to 23.2	842871-2
21.8 to 21.9	842871-3
23.0 to 23.1	842871-4
21.2 to 21.4	842871-5
21.4 to 21.6	842871-6
21.6 to 21.8	842871-7
22.0 to 22.6	842871-8
22.6 to 22.8	842871-9
22.8 to 23.0	842871-10
22.0 to 22.2	842871-11
22.2 to 22.4	842871-12
23.2 to 23.4	842871-13
23.4 to 23.6	842871-14

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
140 MHz IF AMPLIFIER PWB ASSEMBLY PN 843901-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2,C3,C4,C5,C6,C7,C8,C9, C10,C11,C12,C13,C14,C15, C16,C17	0.001	189010A-1	
C18	47 pF	89018-50	CM05ED101J03
C19	0.01	189010A-2	
C20	0.001	189010A-1	
C21	0.1, 63V	189010A-4	
C22	0.01	189010A-2	
C23,C24,C25	0.1, 63V	189010A-4	
C26,C27	10, 35V	189719A-9	Hilton SWT35Z10
C28	0.001	189010A-1	
C29,C30	0.1, 63V	189010A-4	
	DIODES		
CR1,CR2	1N6263	189440A-86	
CR3	1N914	189405A	GE
CR4	1N823A, 6.2V	189437A	
CR5,CR6	1N914	189405A	GE
	CONNECTORS		
J1,J2	Type F, Straight	189396-48	
J3	Right Angle, 6 Pin	189351-36	Molex
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3	8-1/2T	189162-49	
L4	1-1/2T	89162-88	T7-146
L5	Inductor	189169-37	Ferroxcube VK-200/3B-10
L6	1.5	189169A-70	Delevan 1025
L7	1	89169-40	Delevan 1025
L8	0.33	89169-3	Delevan 1025
	TRANSISTORS		
Q1,Q2,Q3,Q4	3SK-121	189888-53	
Q5	MSA0104	89888-81	
Q6	NE416B	189888-39	
Q7	MSA0204	89888-80	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R1	75	189280A	RC07GF750J
R2	360	189200A-11	RC07GF361J
R3	10	189231A	RC07GF100J
R4	360	189200A-11	RC07GF361J
R5,R6	10K	189227A	RC07GF103J
R7	10	189231A	RC07GF100J
R8	10K	189227A	RC07GF103J
R9	1K, 1/8W, 1%	187460A	RN55D1001F
R10	360	189200A-11	RC07GF361J
R11	10	189231A	RC07GF100J
R12,R13,R14	10K	189227A	RC07GF103J
R15	360	189200A-11	RC07GF361J
R16	10	189231A	RC07GF100J
R17	18	89476	RC07GF180J
R18	51	89238-38	RC07GF510J
R19	470	89234	RC07GF471J
R20	18	89476	RC07GF180J
R21	390	89180	RC07GF391J
R22	24	89238-20	RC07GF240J
R23	240	89200-4	RC07GF241J
R24,R25	100K	189278A	RC07GF104J
R26	100	89202	RC07GF101J
R27	1K	189220A	RC07GF101J
R28	2.74K, 1/8W, 1%	187464A	RN55D2R7F
R29	620	189200A-10	RC07GF621J
R30	1.21K, 1/8W, 1%	189256A-13	RN55D1R21F
R31	2.43K, 1/8W, 1%	189256A-13	RN55D2R43F
R32	11K	189238A-35	RC07GF113J
R33	100K	189278A	RC07GF104J
R34	200K	189200A-18	RC07GF204J
R35,R36	1K	189220A	RC07GF101J
R37	220K	189238A-33	RC07GF224J
R38	33	89478	RC07GF330J
R39	24	89238-20	
R40	10K	1879227A	RC07GF103J
R41	10K, 1/8W, 1%	89326	RN55D1003F
R42	732, 1/8W, 1%	88541-77	RN55D732RF
	INTEGRATED CIRCUITS		
U1	TL084	189976-96	
U2	μA78MGU1C	189889-82	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
140 MHz FILTER/PREAMP PWB ASSEMBLY PN 1841936-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2,C3,C4,C5,C6,C7	0.001	189007-14	
C8	10, 35V	189719A-9	Hilton SWT35Z10
C9,C10	0.001	189007-14	
C12	Variable, 1.5-4 pF	189100-29	Matsushita
C13	18 pF, 1%	189008A-95	CM05ED180J03
C15	150 pF	189008A-74	CM05ED151J03
C16	0.001	189007-14	
C17,C19	18 pF, 1%	189008A-95	CM05ED180J03
C20	Variable, 3.2-18 pF	189017-29	Matsushita
C21	Variable, 2.8-10 pF	189017-28	Matsushita
C22	68 pF	189008A-42	CM05ED680J03
C23	18 pF, 1%	189008A-95	CM05ED180J03
	TERMINALS		
E9,E10,E11	Pin	188500-29	Berg
	FEEDTHRUS		
FL1,FL2	1000 pF	189017-94	Erie
	CONNECTORS		
J1	Type F, Straight	189396-48	
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1	2.7	189169A-7	
L2	Inductor	189169-37	Ferroxcube VK200-10/3B
L3	1	189169A-40	
L4	2-1/2T, Red	189162-31	
L5	4-1/2T, Yellow	189162-37	
L6	3-1/2T, Orange	189162-42	
L7	2-1/2T, Red	189162-31	
L8	6-1/2T, Blue	189162-35	
L10	4-1/2T, Yellow	189162-37	
L11	5-/2T, Green	189162-32	
	TRANSISTORS		
Q1	MRF-904	189888-19	
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R1	120	189203A	RC07GF121J
R2	6.8K	189182A	RC07GF682J
R3	12K	189491A	RC07GF123J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R4	430	189238A-31	RC07GF431J03
R5	330	189205A	RC07GF331J
R6	68, 1/2W, 5%	188012	RC20GF680J
R7	33	189478A	RC07GF330J
R8	27	189200A	RC07GF270J
R9,R10	430	189238A-31	RC07GF431J
	TOROID COILS		
T1	6T, Bifilar	1809322-6	
	INTEGRATED CIRCUITS		
U1	MWA-130	189889-72	
	SHORTING PLUGS		
W1	Shorting Plug	188500-23	
	FERRITE BEADS		
Z1,Z2,Z3	Ferrite Bead	189161-20	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
TEMPERATURE CONTROL PWB ASSEMBLY PN 1842744-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1	10, 35V	189719A-9	Hilton SWT35Z10
C2	0.1, 63V	189010A-4	
C3	1.5, 50V	189016A	Kemet
	TERMINALS		
E1,E2,E3,E4,E5,E6,E7,E8,E9	Bifurcated	184844-33	
	TRANSISTORS		
Q2	2N3904	189700A	Motorola
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R2	Potentiometer, 2K	188453-79	Helitrim
R3	10K	189227A	RC07GF103J
R4	11K	189238A-35	RC07GF113J
R5	2.2M	89238-61	
R6	3.9K	189224A	RC07GF392J
R7	27K	188078A	RC07GF273J
R8	3.9K	189224A	RC07GF392J
R9	130	189200A-17	RC07GF131J
R10	3.9K	189224A	RC07GF392J
R11	150	189204A	RC07GF151J
	INTEGRATED CIRCUITS		
U1	LM3911N	89975-74	

HOT STANDBY SWITCH ASSEMBLY PN 842340-1

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	Display PWB Assembly	843330-1	MAC
	Control Logic PWB Assembly	843334-1	MAC
	DC/DC Convertor Assembly	843490-1	MAC
	Backplane PWB Assembly	843332-1	MAC
	Ribbon Cable Assembly	842264-1	MAC
	Wire Harness Assembly		
	RX1 Interconnect	843431-1	MAC
	RX2 Inerconnect	843431-2	MAC
	TX Data & Alarm	843442-1	MAC
	TX PWR	843436-1	MAC
	DC Power Supply	843807-1	MAC
	LED	843333-1	MAC
	Cover	1808396-1	MAC
	Locating		
	Button	843561-1	MAC
	Block	843562-1	MAC
	Panels		
	Center	1840297-3	MAC
	Side	1808239-1	MAC
	Cardguides		
	Top	1840309-1	MAC
	Bottom	1840311-1	MAC
	Extrusion, Side Mount	842345-1	MAC
	Bushing	88509-52	Heyco
	Binding Post	88500-39	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
DISPLAY BOARD PWB ASSEMBLY PN 843330-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1	10, 25V	89719-72	
C2,C3,C4,C5,C6,C7,C8	0.1, 63V	189010A-4	
	LED's		
DS1,DS2	Green	89904-26	5331H
DS3,DS4,DS5,DS6,DS7,DS8, DS9,DS10	Red	89904-27	5331H
DS11	Green	89904-26	5331H
DS12	Red	89904-27	5331H
DS13	Green	89904-26	5331H
DS14	Red	89904-27	5331H
	CONNECTORS		
J1	4 Pin R/A	89351-34	
J2	Pin	188500-29	Berg
	RESISTORS		
All resistors are in ohms 1/4W 5% unless otherwise specified.			
R1,R2,R3,R4,R5,R6,R7, R8,R9,R10,R11,R12,R13, R14,R15,R15	270	189485A	RC07GF271J
R17,R18	1K	189220A	RC07GF101J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
CONTROL LOGIC BOARD PWB ASSEMBLY PN 843334			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2,C3,C4,C5, C6,C7,C8,C9	0,1 63V	189010A-4	
C10	10, 35V	89719-66	Kemet
	TERMINALS		
E1,E2,E3,E4,E5,E6,E7, E8,E9,E10,E11,E12	Pin	188500-29	Berg
	CONNECTORS		
J1	Pin	188500-29	Berg
	RESISTORS		
All resistors are in ohms 1/4W 5% unless otherwise specified.			
R1,R2	1K	189220A	RC07GF101J
R3,R4,R5,R6,R7,R8,R9, R10,R11,R12,R13,R14	100	89202	RC07GF101J
	INTEGRATED CIRCUITS		
U1	74LS04	89974-16	
U2	MM74C08	89975-97	
U3	MC14072B	89974-17	
U4	TBP28L22	843526-1	
U5	TBP28L22 Prom	843526-2	
U6	TBP28L22 Prom	843526-3	
U7	MM74HC76	89974-18	
U8,U9,U10,U11	MC1413	89974-13	
U12	74LS32	89974-15	
U13,U14	FSA2501P Diode Array	189438-22	
	SHORTING PLUGS		
W1,W2,W3,W4	Shorting Plug	188500-23	Berg
	SOCKETS		
XU4,XU5,XU6	Socket, 20 Pin DIP	89891-20	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
BACKPLANE BOARD PWB ASSEMBLY PN 843332-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1	0,1 63V	189010A-4	
C2	4.7, 25V	89719-34	Kemet T330475K025AS
C3	0,1 63V	189010A-4	
C4	4.7, 25V	89719-34	Kemet T330475K025AS
C5,C6	0,1 63V	189010A-4	
	DIODES		
CR1,CR2,CR3,CR4,CR5,CR6	1N4006	189440A-58	
CR7,CR8,CR9,CR10	1N914A	189405	GE
CR11,CR12	1N4006	189440A-58	
CR13	1N914A	189405	GE
	CONNECTORS		
J1	11 Pin Wafer Straight	89348-11	
J2	Socket, 3 Position	89892-30	Weidmuller
J3	D 15S	89760-72	Cannon
J4	Socket, 3 Position	89892-30	Weidmuller
J5,J6	Edge Dual 14 Pin	89760-76	
J7,J8	D 15S	89760-72	Cannon
J9	Edge Dual 44 Pin	89760-75	
J10	D 37S	89760-73	Cannon
J11	Edge Dual 36 Pin	89760-71	
J12	15S	89397-70	Molex
J13	11 Pin Wafer Straight	89348-11	
J14	9S	89350-92	Molex
J15,J16	Socket, 3 Position	89892-30	Weidmuller
J17	6 Pin Wafer Straight	89348-6	
	RELAYS		
K1,K2,K3,K4,K5	RG2L-12VDC Contacts	89800-36	
	RESISTORS		
All resistors are in ohms 1/4W 5% unless otherwise specified.			
R1,R2	0.5, 1W, 3%	88244	Dale RS-1A
R3	51	189238A-38	RC07GF510J
R4	160. 0.15W, 5%	189200A-13	
R5,R6	Socket, 3 Position	89892-30	Weidmuller

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R7	Socket, 3 Position	89892-30	Weidmuller
R8	Socket, 3 Position	89892-30	Weidmuller
R9	100	189202A	RC07GF101J
R10,R11,R12,R13,R14, R15,R16,R17,R18	10K	189227A	RC07GF103J
R19	1K	189220A	RC07GF101J
	INTEGRATED CIRCUITS		
U1	MA7812UC	Motorola	
U2	MC7805	189976-94	
U3	MC1413	89974-13	
	SHORTING PLUGS		
W1,W2,W3,W4	Shorting Plug	188500-23	Berg

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
HOT STANDBY SWITCH ASSEMBLY PN 842340-2			
	Display PWB Assembly	843330-1	MAC
	Control Logic PWB Assembly	843334-1	MAC
	AC Power Supply Assembly	842640-1	MAC
	Backplane PWB Assembly	843332-1	MAC
	Ribbon Cable Assembly	842264-1	MAC
	Wire Harness Assembly		
	RX1 Interconnect	843431-1	MAC
	RX2 Inerconnect	843431-2	MAC
	TX Data & Alarm	843442-1	MAC
	TX PWR	843436-1	MAC
	AC Power Supply	843510-1	MAC
	LED	843333-1	MAC
	Cover	1808396-1	MAC
	Locating		
	Button	843561-1	MAC
	Block	843562-1	MAC
	Panels		
	Center	1840297-3	MAC
	Side	1808239-1	MAC
	Cardguides		
	Top	1840309-1	MAC
	Bottom	1840311-1	MAC
	Extrusion, Side Mount	842345-1	MAC
	Bushing	88509-52	Heyco
	Binding Post	88500-39	

AC POWER SUPPLY ASSEMBLY PN 842640

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	AC Power Supply PWB Assembly	842642-1	MAC
	Bracket	843327-1	MAC
	Transformer	842642-1	MAC
	Connector, Filtered, AC Input	189198-92	Corcom
CR1,CR3,CR4	Bridge Rectifier	189439-40	BR-66
	Lug, Crimp	188380-76	
	Teflon Sleeving	88352-18	
	Fuse, 1A, Slo-Blo	188200-7	
	Heatsink	842117-1	MAC
	Heatsink w/o Slot	842117-2	MAC
	AC Input Shield	1841799-1	MAC

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
AC POWER SUPPLY PWB ASSEMBLY PN 842642			
	CAPACITORS		
C1	3300, 50V	89720-18	
C2,C3,C4	4700, 35V	189719-56	
	TERMINALS		
J1	Pin Bifucated	188500-29 84844-33	Berg

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
HOT STANDBY DUPLEX RF ASSEMBLY 842900			
	Transmitter Hot Standby RF Assy	842901-1	MAC
	Receiver Hot Standby RF Assy	842902-1	MAC
	Mounting Channel	842899-1	MAC
	V-Block	842751-1	MAC
	U-Bolt	808058-6	MAC
	Mounting Hardware Kit	843821-1	MAC

HOT STANDBY RF BOX ASSEMBLY 842901

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	TX Source	1840242-99	MAC
	Input RFI Filter PWB Assembly	843411-1	MAC
	TX Regulator PWB Assembly	1841788-2	MAC
	Switch Driver PWB Assembly	842908-1	MAC
	Housing	842903-1	MAC
	RF Mounting Plate	842905-1	MAC
	W/G Assembly Interface	842906-1	MAC
	Circulator	1841724-1	MAC
	Termination	1841725-1	MAC
	Filters		
	3″	1841726-99	MAC
	4″	842761-99	MAC
	Waveguide Switch	842909-1	MAC
	Waveguide Assemblies WR-42 Str.		
	w/Monitor Port	842911-1	MAC
	6.5″	1841727-5	MAC
	Output Interface	842912-1	MAC
	3 & H Bend	842913-1	MAC
	Brackets		
	W/G Support	842915-1	MAC
	Switch Support	842914-1	MAC
	Wire Harness Assembly	1841847-1	MAC
	Wire Harness Assembly	1842916-1	MAC
	Wire Harness Assembly	842919-1	MAC
	Cable Assembly (F to F)	1840164-9	MAC
	Window, Waveguide	1841878-1	MAC

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RFI BOARD PWB ASSEMBLY 843411			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2,C4,C5	0.1, 100V	189010A-2	
	TERMINALS		
E1,E2,E3,E4,E5,E6,E7,E8, E9,E10	Bifurcated	184844-33	
	CONNECTORS		
J1,J2	6 Pin Lock	89354-6	Molex
	VARISTORS		
VR1,VR2,VR4,VR5	V47ZA7	189195-1	GE

HOT STANDBY RF BOX ASSEMBLY 842902

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	Input RFI Filter PWB Assembly	841720-2	MAC
	RX Regulator PWB Assembly	1841788-1	MAC
	Mixer/Oscillator/Preamp PWB	842870-99	MAC
	140 MHz IF Amplifier PWB	1841930-1	MAC
	Housing	842903-2	MAC
	RF Mounting Plate	842904-1	MAC
	W/G Assembly Interface	842906-2	MAC
	Circulator	1841724-1	MAC
	Termination	1841725-1	MAC
	Waveguide Magic Tee	842910-1	MAC
	Waveguide Assemblies WR-42 Str. H Bend	842479-4	MAC
	Wire Harness Assembly	1841879-1	MAC
	Cable Assembly (F to F)	1840164-9	MAC
	Cable Assembly (F to F)	1840164-12	MAC
	Window, Waveguide	1841878-1	MAC
	Connector, Receptacle, 11 Pin	188358-93	
	Adapter, Pin Type to F	189397-14	Gilbert G-CH-BAFF-KS
	Adapter, F to KS	1842038-1	Gilbert GF-625-CH
	Connector Lock Nut	189397-12	Gilbert G-625

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RFI BOARD PWB ASSEMBLY PN 1841720-2			
	CAPACITORS		
All capacitors are in microfarads unless otherwise spcified.			
C1,C2,C3,C4,C5,C6	0.01, 100V	189010A-2	
	TERMINALS		
E1,E2,E3,E4,E5,E6,E7,E8,E9,E10	Bifurcated	184844-33	
	CONNECTORS		
J1,J2	6 Pin Lock	189354-6	Molex
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3,L4,L5,L6	Inductor	189169-37	Ferroxcube VK200-10/3B
	VARISTORS		
VR1,VR2,VR3,VR4,VR5,VR6	V47Z47	189195-1	GE

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
140 MHz IF AMPLIFIER PWB ASSEMBLY PN 1841930-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2,C3,C4,C5,C6,C7,C8,C9, C10,C11,C12,C13,C14,C15	0.001	189010A-1	
C16	0.1, 63V	189010A-4	
C17	300 pF	189017A-52	CM05ED301J03
C18	100 pF	189086A	CM05ED101J03
C19	0.01	189010A-2	
C20	0.001	189010A-1	
C21	0.1, 63V	189010A-4	
C22	0.01	189010A-2	
C23,C24,C25	0.1, 63V	189010A-4	
C26,C27	10, 35V	189719A-9	Hilton SWT35Z10
C28	0.001	189010A-1	
C29	0.1, 63V	189010A-4	
C30	0.001	189010A-1	
	DIODES		
CR1,CR2,CR3	1N6263	189440A-86	
CR4	1N8923A, 6.2V	189437A	
CR5	1N914	189405A	GE
	CONNECTORS		
J1,J2	Type F, Straight	189396-48	
J3	Right Angle	189351-36	Molex
	INDUCTORS		
All inductors are in microhenries unless otherwise specified.			
L1,L2,L3,L4	8-1/2T	189162-49	
L5	Inductor	189169-37	Ferroxcube VK-200/3B-10
	TRANSISTORS		
Q1,Q2,Q3,Q4,Q5	3SK-121	189888-53	
Q6	NE416B	189888A-39	
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R1	75	189280A	RC07GF750J
R2	360	189200A-11	RC07GF361J
R3	10	189231A	RC07GF100J
R4	360	189200A-11	RC07GF361J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	RESISTORS		
All resistors are in 1/4W 5% ohms unless otherwise specified.			
R5,R6	10K	189227A	RC07GF103J
R7	10	189231A	RC07GF100J
R8	10K	189227A	RC07GF103J
R9	1K	187460A	RC07GF101J
R10	360	189200A-11	RC07GF361J
R11	10	189231A	RC07GF100J
R12,R13,R14	10K	189227A	RC07GF103J
R15	360	189200A-11	RC07GF361J
R16	10	189231A	RC07GF100J
R17	430	189238A-31	RC07GF431J
R18	10K	189227A	RC07GF103J
R19	680	189206A	RC07GF681J
R20	220	189233A	RC07GF221J
R21	56	189232A	RC07GF560J
R22	1.3K	189200A-26	RC07GF132J
R23	910	189200A-19	RC07GF911J
R24,R25	100K	189278A	RC07GF104J
R26	9.1K	189200A-12	RC07GF912J
R27	75	189280A	RC07GF750J
R28	2.74K, 1/8W, 1%	187464A	RN55D2R7F
R29	620	189200A-10	RC07GF621J
R30	1.21K, 1/8W, 1%	189256A-13	RN55D1R21F
R31	2.43K, 1/8W, 1%	189256A-13	RN55D2R43F
R32	11K	189238A-35	RC07GF113J
R33	100K	189278A	RC07GF104J
R34	200K	189200A-18	RC07GF204J
R35,R36	1K	189220A	RC07GF101J
R37	220K	189238A-33	RC07GF224J
	INTEGRATED CIRCUITS		
U1	TL084	189976-96	
U2	μA78MGU1C	189889-82	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
NEGATIVE SWITCH DRIVER PWB ASSEMBLY PN 842907			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1	0.1	189010A-4	
C2	4700	89719-83	
C3	0.1	189010A-4	
C4	10, 50V	189720-5	
C5	0.1	189010A-4	
C6	10, 50V	189720-5	
C7,C8,C9,C10,C11	0.1	189010A-4	
C12	10, 50V	189720-5	
	DIODES		
CR1,CR2	1N6263	89440-86	
CR3	1N823	89437	
CR4	1N914A	189405	GE
CR5,CR6	1N4006	189440-58	
	CONNECTORS		
J1	6 Pin Locking	89354-6	Molex
J2	5 Pin Locking	89354-5	Molex
J3	6 Pin Locking	89354-6	Molex
	TRANSISTORS		
Q1,Q2	MJE 6041	189888-58	
Q3	2N3906	89727	Motorola
	RESISTORS		
All resistors are in ohms 1/4W 5% unless otherwise specified.			
R1	120	89203	RC07GF121J
R2	2.7K, 1/2W, 5%	88035	RC20GF272J
R3	9.53K	89256-83	
R4	1.07K	89262	
R5	13K	89481-42	RC07GF133J
R6	270	89485	RC07GF271J
R7	1.05K, 1/8W, 1%	89327-55	RN55D1R05F
R8	10K	89227	RC07GF103J
R10,R11	1K	89220A	RC07GF101J
R12	2K	89327-82	RC07GF202J
R13	100	89202	RC07GF101J
R14,R15,R16	1K	89220A	RC07GF101J
R17,R18	5.1K	89491	RC07GF512J
R19	430	89238-31	RC07GF431J

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
R20,R21	5.1K	89491	RC07GF512J
R22	430	89238-31	RC07GF431J
R23	475, 1/8W, 1%	89327-49	RN55D475RF
	INTEGRATED CIRCUITS		
U1	LM337T	89889-63	
U2	7912	89976-67	
U3	7805	189976-94	
U4	LM319	89975-24	
U5	7408	189975-2	
U6	NE5532	89975-42	
U7	FSA2501P,Diode Array	189438-22	
	JUMPERS		
W1	Grey	88322-10	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
POWER SUPPLY INTERCONNECT WIRE HARNESS ASSEMBLY PN 1841574			
	Connector, 10 Position	189396-78	Amp
	Key Polarizing	189396-81	Amp

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
DC/DC CONVERTER WIRE HARNESS ASSEMBLY 843755-2			
	Connector, 5 Position, 1DT	89396-91	Amp
	Polarizing Key	189396-81	Amp
R13	Resistor, 3.9Ω, 10W, 3%	88541-72	Dale
R14	Resistor, 100..., 10W, 3%	88541-76	Dale

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
MIXER/OSCILLATOR WIRE HARNESS ASSEMBLY 842869-1			
	Connector, 1DT, 11 Position	89397-58	MAC
	Connector, 1DT, 7 Position	89396-80	MAC
	Polarizing Key	89396-81	MAC

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
LED/WIRE HARNESS ASSEMBLY 843333			
	LED Mounting Plate	843503-1	MAC
	Green LED 2/Mounting Clip	89918-77	
	Connector, 4 Position	89396-83	
	Key	89396-81	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
DC POWER SUPPLY WIRE HARNESS ASSEMBLY 843807			
	Connector, 12 Position, 1DT	89396-93	Amp
	Connector, 11 Position, 1DT	89397-58	Amp
	Polarizing Key	189396-81	Amp

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
TX POWER WIRE HARNESS ASSEMBLY 843436			
	Connector, 9 Pin	89350-81	Molex
	Pin	89396-24	Molex

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
TX DATA & ALARM WIRE HARNESS ASSEMBLY 843442			
	Connector, D Type, 15 Pin	89759-21	Molex
	Junction Shell, Click	89760-78	Cannon

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RX INTERCONNECT WIRE HARNESS ASSEMBLY 843431-1			
	Connector, D Type, 15 Pin	89759-21	Cannon
	Junction Shell, Click	89760-78	Cannon

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RX INTERCONNECT WIRE HARNESS ASSEMBLY 843431-2			
	Connector, D Type, 15 Pin	89759-21	Cannon
	Junction Shell, Click	89760-78	Cannon

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
POWER SUPPLY INTERCONNECT WIRE HARNESS ASSEMBLY 843510			
	Connector, 10 Position, 1DT	189396-78	Amp
	Polarizing Key	189396-81	Amp

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
HOT STANDBY RF HEAD WIRE HARNESS ASSEMBLY 842916			
P1	Connector, 6 Pin	89396-92	Amp
P2	Connector, 5 Pin	89396-91	Amp
	Connector, Mini Circ, 16 Position	89760-63	Cannon

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
WAVEGUIDE SWITCH WIRE HARNESS ASSEMBLY 842919			
	Connector, 6 Pin	89396-92	Amp
	Connector, Circ #10 Shell, 6 Soc	89760-66	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
140 MHz IF AMPLIFIER WIRE HARNESS ASSEMBLY PN 1841879-1			
	Polarizing Key	189396-81	
	Connector, 6 Position, IDT	189396-92	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
POWER WIRE HARNESS ASSEMBLY PN 1841722-1			
	Polarizing Key	189396-81	
	Connector, 6 Position, IDT	189396-92	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RECEIVER WIRE HARNESS ASSEMBLY PN 1841850-1			
	Polarizing Key	189396-81	
	Connector, 7 Position, IDT	189396-80	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
HOT STANDBY RF HEAD WIRE HARNESS ASSEMBLY 843816			
P1	Connector, 6 Pin	89396-92	Amp
P2	Connector, 5 Pin	89396-91	Amp
P3	Connector, 8 Pin	89397-17	Amp
	Polarizing Key	89396-81	

RECEIVER SIMPLEX POWER CABLE PN 1841932-1

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
	Connector, 11 Position	188358-94	Cannon
	Cable, 4 Cond	188305-29	Belden
	RTV 3110	189893-2	
	Type S Catalyst	189893-4	
	Primer, 1200	189893-3	
	Solder Lug	88520-6	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
TRANSMITTER SIMPLEX POWER CABLE PN 1842030-1			
	Connector, 11 Position	188358-94	Cannon
	Cable, 4 Cond	188305-29	Belden
	RTV 3110	189893-2	
	Type S Catalyst	189893-4	
	Primer, 1200	189893-3	
	Solder Lug	88520-6	

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
HOT STANDBY POWER CABLE ASSEMBLY 843343			
	Connector, 16 Position	89760-68	Cannon
	Connector, Plug, 15 Pin	89397-71	Molex
	Pin	89350-22	Molex
	Cable, 15 Cond, #18 AWG	88305-44	Alpha

REF DES	DESCRIPTION	PART NO.	SIMILAR TO
RFI BOARD PWB ASSEMBLY 843806-1			
	CAPACITORS		
All capacitors are in microfarads unless otherwise specified.			
C1,C2,C3,C4	0.1, 63V	189010A-4	
C5,C6,C7,C8	0.01, 100V	189010A-2	
C9	0.1, 63V	189010A-4	
	TERMINALS		
E1,E2,E3,E4,E5,E6,E7,E8, E9,E10,E11,E12,E13,E14,E15	Bifurcated	184844-33	
	CONNECTORS		
J1,J2	6 Pin Lock	89354-6	Molex
J3	8 Pin Lock	89354-8	Molex
	VARISTORS		
VR1,VR2,VR3,VR4,VR5, VR6,VR7,VR8,VR9	V7ZA7	189195-1	GE

MP MASTER
MA29167